UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

REDACTED

APR 12 2016

Exemption 6 Personal Privacy

Dear

Thank you for your January 14, 2016, letter to President Barack Obama, concerning the drinking water quality in Denmark, South Carolina. Your letter was forwarded to the U.S. Environmental Protection Agency's Region 4 office in Atlanta, Georgia for response.

The EPA has jurisdiction over the quality of water supplied by public water systems (PWSs) under the Safe Drinking Water Act and its implementing regulations. EPA has delegated implementation of the drinking water regulations to the South Carolina Department of Health and Environmental Control (SC DHEC). Therefore, the SC DHEC is responsible for investigating and responding to drinking water quality complaints in the state of South Carolina.

Based upon data captured in the Safe Drinking Water Information System (SDWIS), the EPA has no record of health-based violations reported by SC DHEC for the Town of Denmark water system (the water system). Currently, the water system is in compliance with all EPA drinking water standards. Although the water system was deemed to have optimum corrosion control and placed on reduced (every 3 years) monitoring for lead by the state, the system has gone above and beyond its requirement and monitored on an annual basis since 2010. The most recent lead sample results are enclosed for your review. As you will see, there were no lead action level exceedances (>0.015 mg/L). Public water systems are required to develop a lead sampling plan that is representative of their entire distribution system. Once the samples are collected, a calculation is performed to determine the 90th percentile lead sample result. A lead action level exceedance (ALE) is determined when the 90th percentile exceeds 0.015 mg/L. However, an individual sample may exceed the lead ALE without triggering corrective action. A lead ALE may be caused by plumbing and fixtures inside of the home. Lead samples are taken from a citizen's tap to ensure that the water system is analyzing the actual water being consumed. Please see the attached lead sampling protocol. After conferring with SC DHEC, we were informed that they offered to sample water from your mother's home during 2016. However, you insisted that they not enter her home. Therefore, samples were not taken, as outside samples do not meet the sampling protocol.

Exemption 6 Personal Privacy

To address your concern regarding the need for water treatment, it is important to understand that the Town of Denmark currently uses ground water as its source. As such, the wells are treated with gaseous chlorine to prevent contamination. Chlorination is the most common form of treatment for all PWSs. In

most cases, ground water does not require additional water treatment. According to SDWIS, there are four (4) active wells, two (2) inactive wells, two (2) elevated storage tanks and one (1) inactive elevated storage tank. The inactive storage tank has been physically disconnected and connected to the Bamberg Public Works for use only in case of emergencies.

As part of its sanitary survey program, SC DHEC performs a sanitary inspection of the water system on an annual basis. On April 11, 2016, Ms. Janine Morris discussed this information with your mother. Enclosed are the five (5) most recent sanitary survey reports to address the information I sent to the EPA office dated March 30, 2016. You will see that the SC DHEC has continued to work with the water system and track its progress until all deficiencies cited in the Consent Order 10-001-DW and Consent Order 11-072-DW were addressed as documented in the 2013, 2014, 2015 and 2016, sanitary survey reports with findings of no deficiencies. This included testing for iron and manganese, both of which are secondary drinking water regulations. Secondary drinking water regulations are non-enforceable federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water. The water system is meeting the secondary Maximum Contaminant Levels for iron and manganese according to the sanitary survey reports. In addition, the Town of Denmark water system developed a flushing program to address iron and manganese concerns. As a result of the actions taken to address all deficiencies, both Consent Orders were closed on April 11, 2013. The Consent Order Closure memo is also enclosed for your review.

Exemption 6 Personal Privacy

We recommend that you contact your doctor, the local health department and/or the U.S. Center for Disease Control (CDC) regarding your concerns in reference to the lead and manganese blood level analysis provided by your mother.

We appreciate your desire to protect and preserve the environment and are hopeful that this information will alleviate concerns regarding the quality of your mother's drinking water. Please let us know by April 27, 2016, if you have reconsidered SC DHEC's offer to sample for lead inside of your mother's home by contacting Ms. Morris at (404) 562-9480. If you have additional questions, please contact Mr. Cedric Hudson, Town of Denmark Director of Public Works, directly at (803) 793-3734. You may also contact SC DHEC at (803) 898-4300, for more details regarding drinking water lead analysis. Again, if the EPA may be of further assistance, please contact Ms. Morris at (404) 562-9480.

Sincerely,

James D. Giattina
Director
Water Protection Division

Enclosures

cc: Exemption 6 Personal Privacy

Mr. Cedric Hudson
Denmark Director of Public Works

Suggested Directions for Homeowner Tap Sample Collection Procedures

Revised Version: February 2016

These samples are being collected to determine the lead and copper levels in your tap water. This sampling effort is required by the U.S. Environmental Protection Agency and your State under the Lead and Copper Rule, and is being accomplished through a collaboration between the public water system and their consumers (e.g. residents).

Collect samples from a tap that has not been used for at least 6 hours. To ensure the water has not been used for at least 6 hours, the best time to collect samples is either early in the morning or in the evening upon returning from work. Be sure to use a kitchen or bathroom cold water tap that has been used for drinking water consumption in the past few weeks. The collection procedure is described below.

1. Prior arrangements will be made with you, the customer, to coordinate the sample collection. Dates will be set for sample kit delivery and pick-up by water system staff.
2. There must be a minimum of 6 hours during which there is no water used from the tap where the sample will be collected and any taps adjacent or close to that tap. Either early mornings or evenings upon returning home are the best sampling times to ensure that the necessary stagnant water conditions exist. Do not intentionally flush the water line before the start of the 6 hour period.
3. Use a kitchen or bathroom cold-water faucet for sampling. If you have water softeners on your kitchen taps, collect your sample from the bathroom tap that is not attached to a water softener, or a point of use filter, if possible. Do not remove the aerator prior to sampling. Place the opened sample bottle below the faucet and open the cold water tap as you would do to fill a glass of water. Fill the sample bottle to the line marked "1000-mL" and turn off the water.
4. Tightly cap the sample bottle and place in the sample kit provided. Please review the sample kit label at this time to ensure that all information contained on the label is correct.
5. If any plumbing repairs or replacement has been done in the home since the previous sampling event, note this information on the label as provided. Also if your sample was collected from a tap with a water softener, note this as well.
6. Place the sample kit in the same location the kit was delivered to so that water system staff may pick up the sample kit.
7. Results from this monitoring effort and information about lead will be provided to you as soon as practical but no later than 30 days after the system learns of the tap monitoring results. However, if excessive lead and/or copper levels are found, immediate notification will be provided (usually 1-2 working days after the system learns of the tap monitoring results).

Call_____at_____if you have any questions regarding these instructions.

TO BE COMPLETED BY RESIDENT

Water was last used: Time_____ Date_____
Sample was collected: Time_____ Date_____

Sample Location & faucet (e.g. Bathroom sink): _____

I have read the above directions and have taken a tap sample in accordance with these directions.

Signature_____ Date_____

Suggested Directions for Homeowner Tap Sample Collection Procedures
Revised Version: February 2016

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Sample was collected: Time_____ Date_____

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Signature_____ Date_____

DENMARK TOWN OF (0510002)

GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.001 MG/L	1030
GW	LEAD	9/22/2004	0.0011 MG/L	1030
GW	LEAD	9/22/2004	0.0012 MG/L	1030
GW	LEAD	9/22/2004	0.0014 MG/L	1030
GW	LEAD	9/22/2004	0.0019 MG/L	1030
GW	LEAD	9/22/2004	0.0021 MG/L	1030
GW	LEAD	9/22/2004	0.0022 MG/L	1030
GW	LEAD	9/22/2004	0.0022 MG/L	1030
GW	LEAD	9/22/2004	0.0032 MG/L	1030
GW	LEAD	9/22/2004	0.0042 MG/L	1030
GW	LEAD	9/22/2004	0.0048 MG/L	1030
GW	LEAD	9/22/2004	0.005 MG/L	1030
GW	LEAD	9/22/2004	0.0051 MG/L	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0	1030
GW	LEAD	9/18/2007	0.0011 MG/L	1030
GW	LEAD	9/18/2007	0.0014 MG/L	1030
GW	LEAD	9/18/2007	0.0015 MG/L	1030
GW	LEAD	9/18/2007	0.0019 MG/L	1030
GW	LEAD	9/18/2007	0.0021 MG/L	1030
GW	LEAD	9/18/2007	0.0023 MG/L	1030
GW	LEAD	9/18/2007	0.0036 MG/L	1030
GW	LEAD	9/18/2007	0.0049 MG/L	1030
GW	LEAD	9/18/2007	0.0059 MG/L	1030
GW	LEAD	9/18/2007	0.01 MG/L	1030
GW	LEAD	9/18/2007	0.011 MG/L	1030
GW	LEAD	12/10/2010	0	1030
GW	LEAD	12/10/2010	0	1030
GW	LEAD	12/10/2010	0	1030
GW	LEAD	12/10/2010	0	1030
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GW	LEAD	12/10/2010	0	1030
GW	LEAD	12/10/2010	0	1030
GW	LEAD	12/10/2010	0	1030
GW	LEAD	12/11/2010	0	1030
GW	LEAD	12/13/2010	0	1030
GW	LEAD	12/14/2010	0	1030
GW	LEAD	12/14/2010	0	1030
GW	LEAD	12/14/2010	0	1030
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GW	LEAD	12/14/2010	0	1030
GW	LEAD	12/15/2010	0	1030
GW	LEAD	12/15/2010	0	1030
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GW	LEAD	12/15/2010	0	1030
GW	LEAD	12/15/2010	0	1030
GW	LEAD	12/15/2010	0	1030
GW	LEAD	12/15/2010	0	1030
GW	LEAD	7/12/2011	0	1030
GW	LEAD	7/12/2011	0	1030
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GW	LEAD	7/14/2011	0	1030
GW	LEAD	7/14/2011	0	1030
GW	LEAD	7/15/2011	0	1030
GW	LEAD	7/15/2011	0	1030
GW	LEAD	6/13/2012	0	1030
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GW	LEAD	6/14/2012	0	1030
GW	LEAD	6/14/2012	0	1030
GW	LEAD	6/15/2012	0	1030
GW	LEAD	6/15/2012	0	1030
GW	LEAD	6/15/2012	0	1030
GW	LEAD	6/15/2012	0	1030
GW	LEAD	6/15/2012	0	1030
GW	LEAD	6/16/2012	0	1030
GW	LEAD	6/17/2012	0	1030
GW	LEAD	6/18/2012	0	1030
GW	LEAD	6/18/2012	0	1030
GW	LEAD	6/20/2012	0	1030
GW	LEAD	6/20/2012	0	1030
GW	LEAD	6/21/2012	0	1030
GW	LEAD	6/22/2012	0	1030
GW	LEAD	6/13/2012	0.002 MG/L	1030
GW	LEAD	6/14/2012	0.002 MG/L	1030
GW	LEAD	6/21/2012	0.002 MG/L	1030
GW	LEAD	6/14/2012	0.003 MG/L	1030
GW	LEAD	6/14/2012	0.003 MG/L	1030

GW	LEAD	6/14/2012	0.003 MG/L	1030
GW	LEAD	6/19/2012	0.004 MG/L	1030
GW	LEAD	6/14/2012	0.005 MG/L	1030
GW	LEAD	6/27/2012	0.006 MG/L	1030
GW	LEAD	6/15/2012	0.015 MG/L	1030
GW	LEAD	7/11/2012	0	1030
GW	LEAD	7/11/2012	0	1030
GW	LEAD	7/11/2012	0	1030
GW	LEAD	7/12/2012	0	1030
GW	LEAD	7/11/2012	0.003 MG/L	1030
GW	LEAD	9/3/2013	0	1030
GW	LEAD	9/4/2013	0	1030
GW	LEAD	9/4/2013	0	1030
GW	LEAD	9/4/2013	0	1030
GW	LEAD	9/4/2013	0	1030
GW	LEAD	9/5/2013	0	1030
GW	LEAD	9/5/2013	0	1030
GW	LEAD	9/6/2013	0.002 MG/L	1030
GW	LEAD	9/4/2013	0.003 MG/L	1030
GW	LEAD	9/4/2013	0.003 MG/L	1030
GW	LEAD	9/4/2013	0.003 MG/L	1030
GW	LEAD	9/4/2013	0.004 MG/L	1030
GW	LEAD	9/4/2013	0.006 MG/L	1030
GW	LEAD	9/4/2013	0.007 MG/L	1030
GW	LEAD	9/4/2013	0.01 MG/L	1030
GW	LEAD	8/4/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/5/2014	0	1030
GW	LEAD	8/6/2014	0	1030
GW	LEAD	8/19/2014	0	1030
GW	LEAD	8/19/2014	0	1030
GW	LEAD	8/5/2014	0.002 MG/L	1030
GW	LEAD	8/5/2014	0.002 MG/L	1030
GW	LEAD	8/4/2014	0.003 MG/L	1030
GW	LEAD	8/5/2014	0.003 MG/L	1030
GW	LEAD	8/5/2014	0.005 MG/L	1030
GW	LEAD	8/4/2014	0.008 MG/L	1030
GW	LEAD	8/5/2014	0.009 MG/L	1030
GW	LEAD	7/6/2015	0	1030
GW	LEAD	7/6/2015	0	1030
GW	LEAD	7/7/2015	0	1030

GW	LEAD	7/7/2015	0	1030
GW	LEAD	7/7/2015	0	1030
GW	LEAD	7/7/2015	0	1030
GW	LEAD	7/7/2015	0	1030
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GW	LEAD	7/7/2015	0	1030
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GW	LEAD	7/8/2015	0	1030
GW	LEAD	7/8/2015	0	1030
GW	LEAD	7/8/2015	0	1030
GW	LEAD	7/8/2015	0	1030

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

March 28, 2012

Town of Denmark
Attn: Dr. Gerald Wright
4768 Carolina Highway
Denmark, SC 29042

RE: Sanitary Survey
System # 0510002

Dear Dr. Wright:

On March 21, 2012, a follow-up sanitary survey was conducted on the public water system serving the Town of Denmark. The intent of the sanitary survey is to evaluate the public water system's ability to provide a continuous supply of safe drinking water to its customers.

The Town of Denmark public water system received an overall rating of **Unsatisfactory.** Enclosed is a copy of the survey and a report, which includes a description of the public water system, specific findings made during the sanitary survey, and recommendations for correcting any deficiencies. This survey and the report should be kept on file for no less than ten (10) years and be made available to the public or DHEC upon request. It is requested that all parties responsible for the operation and maintenance of the water system review this report promptly.

If you have any questions or if I can be of any assistance, please call me at (803) 641-7670.

Sincerely,

Travis Fuss
Water Manager
EQC Region 5- Aiken

cc: Marty Chaney, Bureau of Water- Compliance
Daniel Malonza, Bureau of Water- Enforcement

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Region 5
Serving Aiken, Allendale, Bamberg, Barnwell, Calhoun and Orangburg Counties
Aiken EQC Office • 206 Beaufort Street NE • Aiken, SC 29801 • Phone: (803) 641-7670 • Fax: (803) 641-7675 • www.scdhec.gov

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
REGION 5 EQC

SANITARY SURVEY REPORT

Town of Denmark
Water System # 0510002
Bamberg County

Introduction

The South Carolina Department of Health and Environmental Control recently conducted a follow-up sanitary survey of the Town of Denmark Public Water System. This survey consisted of a review of the Department files and an on-site inspection by Department personnel on March 21, 2012. The following persons participated in the on-site inspection:

Travis Fuss	SCDHEC - Region 5 EQC, Aiken
Daniel Malonza	SCDHEC- Bureau of Water
Dr. Gerald Wright	Town of Denmark, Mayor
Heyward Robinson	Town of Denmark, Administrator
Jimmie Shepherd	Town of Denmark
Tim Freeman	Town of Denmark
Heyward Robinson	Town of Denmark
William Rose	Consultant

System Description

The Town of Denmark owns and operates a groundwater facility and associated potable water distribution system that serves approximately 3800 by approximately 1501 service connections. The Cox Mill Well has an iron bacteria treatment system, which consists of an injection of HaloSan tablets into the well twice daily while the well is idle. Treatment contact lasts for 60 minutes, and treated water is then available for further disinfection as it is pumped into the distribution system. Information on the system's wells is given in the table below.

Well Information

	Type	Horsepower	Yield (gpm)	Regulated Capacity (TGD)	Treatment
Well One Brooker Center	NOT IN SERVICE				
Well Two Voorhees	Turbine	60	330 gpm	316.80	Gaseous Chlorine
Well Three Legare Street	NOT IN SERVICE				
Well Four Cox Mill	Turbine	50	350	336.00	Gaseous Chlorine Iron Bacteria Removal (HaloSan)
Well Five Acacia Street	Submersible	40	403	386.88	Gaseous Chlorine
Well Six W. Voorhees	Submersible	40	325	312.00	Gaseous Chlorine

Three (3) elevated storage tanks with a total volume of approximately 475,000 gallons serve the Town of Denmark public water system. However, the City Hall Tank was taken offline in late 2008/ early 2009 and was physically disconnected from the system in late 2011. An emergency connection exists with the Town of Bamberg.

Storage Capacity

Tank	Capacity (gallons)
City Hall Elevated Tank (offline)	100,000
Nibco Elevated Tank	250,000
Voorhees Elevated Tank	125,000

Currently, the Town of Denmark public water system has the following operators:

Operator	License	Certification #	Class
Tim Freeman	Treatment	6651	D
	Distribution	1830	G
Jimmie Shepherd	Treatment	7449 (lapsed)	T
	Distribution	931 (lapsed)	G
Travis Clark	Treatment	8674 (lapsed)	T
JP Robinson	Treatment	2418	D
	Distribution	1831	G

Findings and Recommendations

1. The system was upgraded to a **Satisfactory** rating for Chemical Feed. The purpose of this item it to ensure that the water system's chemical feed system is properly installed, maintained, and housed to provide adequate treatment, to prevent the potential for contamination, and to provide operator and public safety. Chemical feed lines at all wells have now been labeled to include contents and the direction of flow. In addition, the Town of Denmark is now more familiar with the function of the HaloSan iron bacteria removal system at the Cox Mill Well. They hired an outside resource to train current staff on the treatment system. The Town also purchased and is now using a HaloSan residual test kit to monitor the system.

2. The system was upgraded to a **Satisfactory** rating for Chemical Storage and Handling. The purpose of this item is to ensure that a sufficient supply of chemicals are available on-site and that these chemicals are properly stored and handled. The electrical problem at the Cox Mill Well has been rectified and chlorine cylinders are no longer stored in a manner that poses a public health risk.

3. The system maintained a **Satisfactory** rating for Chemical Injection Points. The purpose of this item is to confirm that chemical injection points are properly located to feed the chemical in a safe manner and do not interfere with other chemical additions. The chlorine injection point at the Voorhees Well has now been located and placed in a chemical feed vault. During the follow-up survey, however, it was found that the Cox Mill Well chlorine injection point was also

underground. As noted in the last survey, should problems associated with the chemical feed system arise in the future, or if maintenance requires excavation, the injection point should be placed and maintained within a vault box.

4. The system maintained a **Needs Improvement** rating for Water Quality. The purpose of this item is to ensure that a water system consistently produces water which complies with established water quality standards. The Department continues to receive complaints regarding water quality, however the most recent analytical results show improvement in the levels of iron and manganese. The Department will continue to monitor the drinking water quality for long term success in providing more acceptable water to its customers.

   Please note this item is considered a Significant Deficiency Item pursuant to the Ground Water Rule.

5. The system was upgraded to a **Satisfactory** rating for Cross Connection Control. The purpose of this item is to ensure that a program is in place to identify and eliminate hazardous cross connections. The 5 testable backflow prevention devices that had not been tested at the time of the last survey or that failed initial testing have been repaired and tested to prove they are now working.

6. The system was downgraded to an **Unsatisfactory** rating for Valve/Hydrant Maintenance. The purpose of this item is to ensure that valves and hydrants are being maintained such that they can be located and operated as needed.

   At a minimum, the valve program should include:
   - An updated system map indicating the location and identification of all valves
   - A schedule for regular exercise and routine maintenance
   - Documentation of valve type, date of last exercise, number of turns to close, and a record of routine maintenance for each valve
   - Documentation that valves are being exercised in accordance with the plan and that necessary maintenance is being performed

   The hydrant program should include:
   - An updated system map indicating the location and identification of all hydrants
   - A schedule for flow testing and performing routine maintenance
   - Documentation of hydrant type, date of installation, and a record of maintenance work performed for each hydrant
   - Documentation indicating that maintenance and exercise are being performed in accordance with the plan

   The Valve/Hydrant Maintenance program is currently under review and revision by the water system. All hydrants have been located and mapped using global positioning system (GPS) technology. The written program is not complete, valves and hydrants have not been exercised except during flushing events.

7. The system was upgraded to a **Needs Improvement** rating for Flushing Plan. The purpose of this item is to ensure that the system's routine flushing program is adequate to help maintain a disinfectant residual throughout the system, as well as to help prevent water quality issues

associated with stagnant, discolored, and sediment laden water. Although the written program is not final and available for review, the water system has begun weekly flushing events across the system. A flushing worksheet has been designed and is being utilized to flush 5 rotating hydrants across the entire distribution system each and every week. The newly established flushing events have only taken place for 2 weeks but the system expects the flushing to help with stagnant and discolored water. The system is also planning one unidirectional system-wide flushing event per year with the first to take place in mid-April. The Department looks forward to evaluating the Flushing Program's success at the next survey.

8. The system received an **Unsatisfactory** rating for Fire Flow. The purpose of this item is to ensure that the water system can provide adequate flow to protect the integrity of their water system when fire protection is provided. Hydrants must be flow tested at a minimum of once every three years. The minimum flow required for fire protection is 500 gpm. At the time of the follow-up survey, the hydrants had not been flow tested in three years. According to system personnel the hydrants were last tested in 2008.

9. The system maintained an **Unsatisfactory** rating for Leak Detection and Repair. The purpose of this item is to ensure that the system is actively searching for water line leaks and is using sanitary practices to repair leaks. During a complaint investigation performed in December 2011, 6 water leaks were found and brought to the Town's attention. Those leaks have since been repaired but it is necessary for the Town to take a more active approach in locating leaks via visual or audible inspection and fixing them as soon as possible. Leaks are generally recorded through work orders. It is recommended that the system generate a leak repair form that includes the date of the repair, the location, the size of the line, the disinfection method, the flushing procedure, and the resulting chlorine residual.

   At the time of the survey, a full water audit was still not available for review. The system has done a basic water comparison of water sold versus water pumped, and reports water loss of approximately 42%. However, the water audit should include water used for flushing, fire fighting, leak loss, etc. This item has been mentioned on numerous previous inspection reports.

10. The system was upgraded to a **Satisfactory** rating for Storage Maintenance. The purpose of this item is to ensure the system's storage tanks are properly maintained to guarantee their good working condition. As requested by the Department, the Town Hall tank has been valved off from the distribution system and the concrete pad at the base of the Voorhees storage tank has been repaired. In addition, the Town hired a contractor to perform a comprehensive internal and external inspection of the Voorhees and Nibco tanks. A review of the inspection report from the contractor found a few deficiencies. According to Mr. Heyward Robinson, Administrator, the Town plans to follow-up on the recommendations. Please note that a failure to address items needing attention will result in a downgraded rating for Storage Maintenance at the next routine Sanitary Survey. The Department requests that the system provide a maintenance schedule of each tank detailing the actions to be taken.

11. The system was downgraded to an **Unsatisfactory** rating for Operation and Control. The purpose of this item is to ensure that the water system is operated in a manner that provides safe, reliable water to the customers. This rating is a direct result of high water loss and a continuing lack of a proactive approach to system operation and control.

12. The system was upgrade to a **Satisfactory** rating for Sample Siting Plan. The purpose of this item is to determine if the sample siting plan is adequate to ensure that there is no place in the distribution system where microbiological contamination could persist with little chance of detection. The system has reevaluated the bacteriological sampling locations and included a map of the distribution system. All areas of the distribution system appear to be covered in the plan and the five sample points are rotated every three months. Please note that the sample siting plan should continuously be evaluated to ensure that the dead-end lines or areas serviced by smaller sized lines are covered.

13. The system was upgraded to a **Satisfactory** rating for Monitoring/Record Keeping. The purpose of this item is to ensure that the water system is monitoring their treatment process and maintaining records that verify that they are checking equipment operation and drinking water quality on a routine basis. Since the last survey, the system is more knowledgeable of the HaloSan iron bacteria removal system and is more closely monitoring its operation. Daily well visits are being made by an operator of the appropriate grade, and the daily water analyses are being performed as required.

14. The system maintained an **Unsatisfactory** rating for Corrections from Previous Survey. The purpose of this item is to make sure that water systems return to compliance after deficiencies have been documented on previous sanitary surveys. Although some corrections and improvements have been made since the last survey, several remaining deficiencies listed in this report are items cited in the previous report. They include the Flushing Program, Operation and Control, Valve and Hydrant Maintenance, Leak Detection and Repair, Staffing, Procedures Manual, and Water Quality.

    Please note this item is considered a Significant Deficiency Item pursuant to the Ground Water Rule.

15. The system received an **Unsatisfactory** rating for Procedures Manual. The purpose of this item is to ensure that a water system maintains written procedures for the operation and maintenance of its system. At the time of the follow-up survey, no organized compilation was available. The system was in the process of developing a new procedures manual but it was not finished. According to the Town, a complete procedures manual will be available for review in a few weeks.

16. The system was downgraded to an **Unsatisfactory** rating for Staffing. The purpose of this item is to ensure that all water systems employ adequate staff to properly operate and maintain the system. The downgraded rating is a direct result of the failure to continuously manage the system proactively, correct previous deficiencies, and provide appropriate and organized documentation of maintenance activities. Although the Town has hired a Consultant to help develop procedures and help bring the system into compliance, staffing levels remain the same. A system of this size should employ at least one full-time operator of the appropriate grade or higher in addition to other staff, as needed, to ensure the system is being properly operated and maintained.

Conclusions

Due to the nature of the items listed above, and failure to address items noted in the previous survey and Consent Order, the Town of Denmark has been referred to the Department's Drinking Water Enforcement section for further review and resolution. The Department is committed to working with the water system to ensure that the residents of Denmark receive safe and reliable drinking water.

D H E C
PROMOTE PROTECT PROSPER
Catherine B. Templeton, Director
Promoting and protecting the health of the public and the environment

March 9, 2013

Town of Denmark
Attn: Dr. Gerald Wright
4768 Carolina Highway
Denmark, SC 29042

RE: Sanitary Survey
System # 0510002

Dear Dr. Wright:

On February 19, 2013, a follow-up sanitary survey was conducted on the public water system serving the Town of Denmark. The intent of the sanitary survey is to evaluate the public water system's ability to provide a continuous supply of safe drinking water to its customers.

The Town of Denmark public water system received an overall rating of **Satisfactory**. Enclosed is a copy of the survey and a report, which includes a description of the public water system, specific findings made during the sanitary survey, and recommendations for correcting any deficiencies. This survey and the report should be kept on file for no less than ten (10) years and be made available to the public or DHEC upon request. It is requested that all parties responsible for the operation and maintenance of the water system review this report promptly.

If you have any questions or if I can be of any assistance, please call me at (803) 642-1637.

Sincerely,

Travis Fuss
Water Manager
Midlands BEHS, Aiken

cc: Marty Chaney, Bureau of Water- Compliance
Daniel Malonza, Bureau of Water- Enforcement

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
REGION 5 EQC

SANITARY SURVEY REPORT

Town of Denmark
Water System # 0510002
Bamberg County

Introduction

The South Carolina Department of Health and Environmental Control recently conducted a follow-up sanitary survey of the Town of Denmark Public Water System. This survey consisted of a review of the Department files and an on-site inspection by Department personnel on February 19, 2013. The following persons participated in the on-site inspection:

Travis Fuss	SCDHEC - Midlands BEHS, Aiken
Dennis Townsend	SCDHEC- Midlands BEHS, Aiken
Cedric Hudson	Town of Denmark, Public Works Director
Travis Taylor	Town of Denmark, Operator

System Description

The Town of Denmark owns and operates a groundwater facility and associated potable water distribution system that serves approximately 3800 by approximately 1501 service connections. The Cox Mill Well has an iron bacteria treatment system, which consists of an injection of HaloSan tablets into the well twice daily while the well is idle. Treatment contact lasts for 60 minutes, and treated water is then available for further disinfection as it is pumped into the distribution system. Information on the system's wells is given in the table below.

Well Information

	Type	Horsepower	Yield (gpm)	Regulated Capacity (TGD)	Treatment
Well One Brooker Center	NOT IN SERVICE				
Well Two Voorhees	Turbine	60	330 gpm	316.80	Gaseous Chlorine
Well Three Legare Street	NOT IN SERVICE				
Well Four Cox Mill	Turbine	50	350	336.00	Gaseous Chlorine Iron Bacteria Removal (HaloSan)
Well Five Acacia Street	Submersible	40	403	386.88	Gaseous Chlorine
Well Six W. Voorhees	Submersible	40	325	312 .00	Gaseous Chlorine

Two (2) elevated storage tanks with a total volume of approximately 375,000 gallons serve the Town of Denmark public water system. The City Hall Tank was taken offline and physically disconnected from the system in late 2011. An emergency connection exists with the Town of Bamberg.

Storage Capacity

Tank	Capacity (gallons)
City Hall Elevated Tank (offline)	100,000
Nibco Elevated Tank	250,000
Voorhees Elevated Tank	125,000

Currently, the Town of Denmark public water system has the following operators:

Operator	License	Certification #	Class
Cedric Hudson	Treatment	5044	A
	Distribution	785	A
Tim Freeman	Treatment	6651	D
	Distribution	1830	G
Jimmie Shepherd	Treatment	7449 (lapsed)	T
	Distribution	931 (lapsed)	T
Travis Clark	Treatment	8674	T
	Distribution	3889	T
JP Robinson	Treatment	2418	D
	Distribution	1831	G

Findings and Recommendations- *Please note that all items requiring action are italicized.*

1. The system was upgraded to a **Satisfactory** rating for **Water Quality**. The purpose of this item is to ensure that a water system consistently produces water which complies with established water quality standards. Sampling performed within the distribution system back in December 2011 showed that the water was meeting the secondary MCLs for iron and manganese. In addition, as planned after the last sanitary survey distribution sampling for iron, manganese, and total coliform was performed in December 2012. All results were well within acceptable limits as established by the Environmental Protection Agency (EPA). *Considering the history of poor drinking water quality in Denmark, this item will be closely evaluated during each subsequent Sanitary Survey.*

2. The system maintained a **Satisfactory** rating for **Flushing Plan**. The purpose of this item is to ensure that the system's routine flushing program is adequate to help maintain a disinfectant residual throughout the system, as well as to help prevent water quality issues associated with stagnant, discolored, and sediment laden water. The system is doing a good job of routinely flushing their system and documenting flushing activities. The weekly flushing events seem to be improving water quality and preventing customer complaints. Although this flushing is important to maintaining chlorine residuals throughout the system, a rigorous yearly unidirectional flushing event will serve to more effectively scour the lines. The Department looks forward to evaluating the unidirectional flushing event at the next survey. As mentioned during the survey, it is important to continue communicating flushing events with the customers so that they will be prepared for potential discoloration. Please ensure the weekly flushing program is incorporated into the written Flushing Program and the Procedures Manual. It appears that two written

Flushing Program's are in existence. To prevent confusion and promote organization there should only be one.

3. The system was upgraded to a **Satisfactory** rating for **Fire Flow**. The purpose of this item is to ensure that the water system can provide adequate flow to protect the integrity of their water system when fire protection is provided. Hydrants must be flow tested at a minimum of once every three years with a minimum flow required for fire protection of 500 gpm. Fred Taylor with SC DHEC- BOW met with system representatives in October 2012 and explained the proper procedures for flow testing hydrants. All fire hydrants were then tested by the Town during the month of January 2013. A review of the testing results reveals that all hydrants appear to meeting minimum flows and pressure.

4. The system was upgraded to a **Satisfactory** rating for **Leak Detection and Repair** and given a **Satisfactory** rating for **Water Audits**. *Please note that in accordance with the previous Sanitary Survey program, these two survey items were evaluated as one item during the last survey.* The Town continues to do a good job of proactively identifying leaks, properly addressing the leak, and adequately documenting the repair procedures. In addition, a full water audit was available for review. The Town is not only comparing water sold versus water pumped, but it is also including tangible numbers associated with line flushing, fire fighting, leak loss/ repairs, metered facilities, and unmetered facilities. The Town has calibrated its meters on the wells to ensure more accurate production numbers and is continuing to replace water meters as time allows. Although they are not able to replace 320 per year as previously planned, progress continues to be made. It is highly recommended that the Town download and use the American Water Works Association (AWWA) free water audit software to aid in completing and interpreting water audits. The free software can be found at: http://tinyurl.com/auditsoftware.

5. The system received a **Satisfactory** rating for **Storage Maintenance**. The purpose of this item is to ensure the system's storage tanks are properly maintained to guarantee their good working condition. The water level gauge needs repair at the Nibco Tank. Although the Town has paid for the repair, they are still awaiting the work to be performed by the contractor. *Please inform the Department in writing when the repair is made.* To ensure that this item is not downgraded at the next survey, the deficiency needs to be addressed immediately.

Conclusions

The Department appreciates the attention given to this report. The Department is committed to working with the water system to ensure that the residents of Denmark receive safe and reliable drinking water. If you have any questions regarding the report, please do not hesitate to call.

MEMORANDUM

TO: Main File of the City of Denmark
Public Water System No. 0510002

FROM: Daniel S. Malonza
Drinking Water Enforcement Section

DATE: April 11, 2013

RE: Project Closure, CO 10-001-DW & 11-072-DW

The project was referred for failure to properly operate and maintain the public water system.

The deficiencies have been corrected and the water system rated "satisfactory" during the February 19, 2013, follow-up sanitary survey.

The Project was closed on April 11, 2013.

D H E C

PROMOTE PROTECT PROSPER

Catherine B. Templeton, Director

Promoting and protecting the health of the public and the environment

March 14, 2014

Town of Denmark
Attn: Dr. Gerald Wright
4768 Carolina Highway
Denmark, SC 29042

RE: Sanitary Survey
System # 0510002

Dear Dr. Wright:

On February 6, 2014, a follow-up sanitary survey was conducted on the public water system serving the Town of Denmark. The intent of the sanitary survey is to evaluate the public water system's ability to provide a continuous supply of safe drinking water to its customers.

The Town of Denmark public water system received an overall rating of **Satisfactory**. Enclosed is a copy of the survey and a report, which includes a description of the public water system, specific findings made during the sanitary survey, and recommendations for correcting any deficiencies. This survey and the report should be kept on file for no less than ten (10) years and be made available to the public or DHEC upon request. It is requested that all parties responsible for the operation and maintenance of the water system review this report promptly.

If you have any questions or if I can be of any assistance, please call me at (803) 641-7670.

Travis Fuss
Midlands EQC Region – Aiken
206 Beaufort Street, NE
Aiken, SC 29801
Phone (803) 642-1637 Fax (803) 643-4027

cc: Marty Chaney, Bureau of Water

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
REGION 5 EQC

SANITARY SURVEY REPORT

Town of Denmark
Water System # 0510002
Bamberg County

Introduction

The South Carolina Department of Health and Environmental Control recently conducted a sanitary survey of the Town of Denmark Public Water System. This survey consisted of a review of the Department files and an on-site inspection by Department personnel on February 6, 2014. The following persons participated in the on-site inspection:

Travis Fuss	SCDHEC - Midlands BEHS, Aiken
Cedric Hudson	Town of Denmark, Public Works Director
Travis Taylor	Town of Denmark, Operator

System Description

The Town of Denmark owns and operates a groundwater facility and associated potable water distribution system that serves approximately 3800 by approximately 1501 service connections. The Cox Mill Well has an iron bacteria treatment system, which consists of an injection of HaloSan tablets into the well twice daily while the well is idle. Treatment contact lasts for 60 minutes, and treated water is then available for further disinfection as it is pumped into the distribution system. Information on the system's wells is given in the table below.

Well Information

	Type	Horsepower	Yield (gpm)	Regulated Capacity (TGD)	Treatment
Well One Brooker Center	NOT IN SERVICE				
Well Two Voorhees	Turbine	60	330 gpm	316.80	Gaseous Chlorine
Well Three Legare Street	NOT IN SERVICE				
Well Four Cox Mill	Turbine	50	350	336.00	Gaseous Chlorine Iron Bacteria Removal (HaloSan)
Well Five Acacia Street	Submersible	40	403	386.88	Gaseous Chlorine
Well Six W. Voorhees	Submersible	40	325	312 .00	Gaseous Chlorine

Two (2) elevated storage tanks with a total volume of approximately 375,000 gallons serve the Town of Denmark public water system. The City Hall Tank was taken offline and physically disconnected from the system in late 2011. An emergency connection exists with the Town of Bamberg.

Storage Capacity

Tank	Capacity (gallons)
City Hall Elevated Tank (offline)	100,000
Nibco Elevated Tank	250,000
Voorhees Elevated Tank	125,000

Currently, the Town of Denmark public water system has the following operators:

Operator	License	Certification #	Class
Cedric Hudson	Treatment	5044	A
	Distribution	785	A
Tim Freeman	Treatment	6651	D
	Distribution	1830	G
Jimmie Shepherd	Treatment	7449 (lapsed)	T
	Distribution	931 (lapsed)	T
Travis Clark	Treatment	8674	T
	Distribution	3889	T

Findings and Recommendations- *Please note that all items requiring action are italicized.*

1. The system maintained a **Satisfactory** rating for **Water Quality.** The purpose of this item is to ensure that a water system consistently produces water which complies with established water quality standards. Recently, the Department has not received many complaints of discolored water. In addition, sampling performed within the distribution system in September 2013 showed that the drinking water is without total coliform bacteria and that it is meeting the secondary MCLs for iron and manganese. *Considering the history of poor drinking water quality in Denmark, this item will be closely evaluated during each subsequent Sanitary Survey.*

2. The system maintained a **Satisfactory** rating for **Flushing Plan**. The purpose of this item is to ensure that the system's routine flushing program is adequate to help maintain a disinfectant residual throughout the system, as well as to help prevent water quality issues associated with stagnant, discolored, and sediment laden water. The system is doing a good job of routinely flushing their system and documenting flushing activities. The weekly flushing events seem to be improving water quality and preventing customer complaints. Although this flushing is important to maintaining chlorine residuals throughout the system, **a rigorous yearly unidirectional flushing event will serve to more effectively scour the lines. The Department looks forward to evaluating the unidirectional flushing event at the next survey.** As mentioned during the survey, it is important to continue communicating flushing events with the customers so that they will be prepared for potential discoloration. To effectively perform the task of unidirectional flushing, the Department encourages the system to work closely with the SC Rural Water Association to ensure the flushing is done properly.

3. The system maintained a **Satisfactory** rating for **Fire Flow**. The purpose of this item is to ensure that the water system can provide adequate flow to protect the integrity of their water system when fire protection is provided. Hydrants must be flow tested at a minimum of once every three years with a minimum flow required for fire protection of 500 gpm. All fire hydrants were tested by the Town during the month of January 2013. A review of the testing results reveals that all hydrants appear to be meeting minimum flows and pressure.

4. The system received a **Satisfactory** rating for **Storage Maintenance**. The purpose of this item is to ensure the system's storage tanks are properly maintained to guarantee their good working condition. As requested at the last survey, the water level gauge at the Nibco Tank has been repaired.

5. The system received a **Satisfactory** rating for **Monitoring and Recordkeeping**. The purpose of this item is to ensure the water system is monitoring their treatment process and maintaining records that verify that they are checking equipment operation and drinking water quality on a routine basis. The Department employs the appropriate grade treatment operator and it appears that daily inspections are being performed as required. Please ensure that enough detail is being recorded in the well logs such that exactly who performed what task can easily be distinguished. The daily visit by the appropriately graded treatment operator needs to be clearly recorded with a detailed description of any tasks performed. If other staff visit a treatment plant and perform certain tasks (such as, checking chlorine residuals), the visit and actions should be documented as well.

Conclusions

The Department appreciates the attention given to this report. The Department is committed to working with the water system to ensure that the residents of Denmark receive safe and reliable drinking water. If you have any questions regarding the report, please do not hesitate to call.

D H E C

PROMOTE. PROTECT. PROSPER.

W. Marshall Taylor Jr., Acting Director

Promoting and protecting the health of the public and the environment

ebruary 5, 2015

'own of Denmark
.ttn: Dr. Gerald Wright
768 Carolina Highway
'enmark, SC 29042

.E: Sanitary Survey
ystem # 0510002

'ear Dr. Wright:

n February 4, 2015, a sanitary survey was conducted on the public water system serving
e Town of Denmark. The intent of the sanitary survey is to evaluate the public water system's
)ility to provide a continuous supply of safe drinking water to its customers.

he Town of Denmark public water system received an overall rating of Satisfactory. Enclosed is a
)py of the survey and a report, which includes a description of the public water system, specific
ndings made during the sanitary survey, and recommendations for correcting any deficiencies.
his survey and the report should be kept on file for no less than ten (10) years and be made
'ailable to the public or DHEC upon request. It is requested that all parties responsible for the
)eration and maintenance of the water system review this report promptly.

you have any questions or if I can be of any assistance, please call me at (803) 533-5490.

ncerely,

Lewis Rourk

:wis Rourk
)w Country EQC Region - Orangeburg
50 Carolina Avenue
'angeburg, SC 29115-4944
one (803) 533-5490 Fax (803) 268-5784

: Marty Chaney, Bureau of Water

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
LOW COUNTRY EQC REGION - ORANGEBURG

SANITARY SURVEY REPORT

Town of Denmark
Water System # 0510002
Bamberg County

Introduction

The South Carolina Department of Health and Environmental Control recently conducted a sanitary survey of the Town of Denmark public water system. This survey consisted of a review of the Department files and an on site inspection by a representative of the Department on February 4, 2015. The following persons participated in the on site inspection:

Lewis Rourk	SCDHEC - Low Country EQC Region - Orangeburg
Cedric Hudson	Town of Denmark, Public Works Director
Tim Freeman	Town of Denmark, Operator
Travis Taylor	Town of Denmark, Operator

System Description

The Town of Denmark owns and operates a groundwater facility and associated potable water distribution system that serves a population of approximately 3,500 residents and approximately 2,064 students and staff at Voorhees College and Denmark Tech by 1501 service connections - 1,417 residential and 84 commercial. The Cox Mill well has an iron bacteria treatment system which consist of an injection of HaloSan tablets into the well twice daily while the well is idle. Treatment contact last for 60 minutes, and treated water is available for further disinfection as it is pumped into the distribution system. Information on the system's wells is given in the table below. The Town of Denmark system has a total capacity of 1,351,680 gallons per day.

Well	Well Type	Pump (HP)	Yield (GPM)	Regulated Capacity	Treatment
Well Two Voorhees	Turbine	60	330	316.80 TGD	Gaseous Chlorine
Well Four Cox Mill	Turbine	50	350	336.00 TGD	Gaseous Chlorine HaloSan tablets
Well Five Acacia Street	Submersible	40	403	386.88 TGD	Gaseous Chlorine
Well Six W. Voorhees	Submersible	40	325	312.00 TGD	Gaseous Chlorine

Well One - Brooker Center and Well Three - Legare Street are no longer in service. Two elevated storage tanks with a total volume of approximately 375,000 gallons - Nibco Tank 250,000 gallons and Voorhees Tank 125,000 gallons - serve the Town of Denmark public water system. The City Hall Tank was taken off line and physically disconnected from the system in late 2011. An emergency connection exists with the Town of Bamberg.

Currently, the Town of Denmark public water system has the following operators:

Operator	License	Certification #	Operator Grade
Cedric Hudson	Treatment	5044	A
	Distribution	785	A
Tim Freeman	Treatment	6651	D
	Distribution	1830	G
Travis Clark	Treatment	8674	T
	Distribution	3889	T

Findings and Recommendations

1. The system received a **Satisfactory** rating for **Water Quality**. The purpose of this item is to ensure that a water system consistently produces water which complies with established water quality standards. Recently the Department has not received many complaints of discolored water. In addition, sampling performed within the distribution system in 2014 showed that the drinking water is without total coliform bacteria and that it is meeting the secondary MCLs for iron and manganese. **Considering the history of poor drinking water quality in Denmark, this item will be closely evaluated during each subsequent Sanitary Survey.**

2. The system received a **Satisfactory** rating for **Fire Flow.** The purpose of this item is to ensure that the water system can provide adequate flow to protect the integrity of their water system when fire protection is provided. Hydrants must be flow tested at a minimum of once every three years with a minimum flow required for fire protection of 500 gpm. All fire hydrants were tested during the month of January 2013. The flow was greater than 500 gpm at all of the hydrants

3. The system received a **Satisfactory** rating for **Flushing Program.** The purpose of this item is to ensure that the system's routine flushing program is adequate to help maintain a disinfectant residual throughout the system, as well as to help prevent water quality issues associated with stagnant, discolored, and sediment laden water over the long term. Two types of flushing programs are recommended for public water systems: 1) a system-wide flushing, where scouring velocities are maintained to clean the water lines, and 2) low velocity flushing used to maintain chlorine residuals in the distribution system. The system is doing a good job of routinely

flushing their system and documenting flushing activities. The weekly flushing events seem to be improving water quality and preventing customer complaints. It is important to continue communicating flushing events with the customers so that they will be prepared for potential discoloration.

4. The system received a **Satisfactory** rating for **Monitoring and Record Keeping.** The purpose of this item is to ensure the water system is monitoring their treatment process and maintaining records that verify that they are checking equipment operation and drinking water quality on a routine basis. Daily inspections are being performed as required.

5. The system received a **Satisfactory** rating for Sample Siting Plan. The plan has a map denoting all bacteriological monitoring locations. Records indicated that these locations were being sampled as scheduled in the plan.

Conclusions

The Town of Denmark public water system is being operated in a safe and reliable manner. The Department would like to thank Mr. Cedric Hudson, Tim Freeman, and Travis Clark for their assistance in conducting the sanitary survey. The Department looks forward to working with the system to ensure that the residents of Denmark continue to receive the highest quality drinking water.

Catherine E. Heigel, Director
Promoting and protecting the health of the public and the environment

February 23, 2016

Town of Denmark
Attn: Dr. Gerald Wright
4768 Carolina Highway
Denmark, SC 29042

RECEIVED
FEB 24 2016
Bureau of Water
Drinking Water Protection Division

RE: Sanitary Survey
System # 0510002

Dear Dr. Wright:

On February 11, 2016, a sanitary survey was conducted on the public water system serving the Town of Denmark. The intent of the sanitary survey is to evaluate the public water system's ability to provide a continuous supply of safe drinking water to its customers.

The Town of Denmark public water system received an overall rating of **Satisfactory**. Enclosed is a copy of the survey and a report, which includes a description of the public water system and specific findings made during the sanitary survey. This survey and the report should be kept on file for no less than ten (10) years and be made available to the public or DHEC upon request. It is requested that all parties responsible for the operation and maintenance of the water system review this report promptly.

If you have any questions or if I can be of any assistance, please call me at (803) 533-5490.

Sincerely,

Lewis Rourk

Lewis Rourk
Low Country EQC Region - Orangeburg
1550 Carolina Avenue
Orangeburg, SC 29115-4944
Phone (803) 533-5490 Fax (803) 268-5784

cc: Marty Chaney, Bureau of Water

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
LOW COUNTRY EQC REGION - ORANGEBURG

SANITARY SURVEY REPORT

Town of Denmark
Water System # 0510002
Bamberg County

Introduction

The South Carolina Department of Health and Environmental Control recently conducted a sanitary survey of the Town of Denmark public water system. This survey consisted of a review of the Department files and an on site inspection by a representative of the Department on February 11, 2016. The following persons participated in the on site inspection:

Lewis Rourk	SCDHEC - Low Country EQC Region - Orangeburg
Cedric Hudson	Town of Denmark, Public Works Director
Travis Clark	Town of Denmark

System Description

The Town of Denmark owns and operates a groundwater facility and associated potable water distribution system that serves a population of approximately 3,500 residents and approximately 2,064 students and staff at Voorhees College and Denmark Tech by 1501 service connections - 1,417 residential and 84 commercial. The Cox Mill well has an iron bacteria treatment system which consist of an injection of HaloSan tablets into the well twice daily while the well is idle. Treatment contact last for 60 minutes, and treated water is available for further disinfection as it is pumped into the distribution system. Information on the system's wells is given in the table below. The Town of Denmark system has a total capacity of 1,351,680 gallons per day.

Well	Well Type	Pump (HP)	Yield (GPM)	Regulated Capacity	Treatment
Well Two Voorhees	Turbine	60	330	316.80 TGD	Gaseous Chlorine
Well Four Cox Mill	.Turbine	50	350	336.00 TGD	Gaseous Chlorine HaloSan tablets
Well Five Acacia Street	Submersible	40	403	386.88 TGD	Gaseous Chlorine
Well Six W. Voorhees	Submersible	40	325	312.00 TGD	Gaseous Chlorine

Well One - Brooker Center and Well Three - Legare Street are no longer in service. Two elevated storage tanks with a total volume of approximately 375,000 gallons - Nibco Tank 250,000 gallons and Voorhees Tank 125,000 gallons - serve the Town of Denmark public water system. The City Hall Tank was taken off line and physically disconnected from the system in late 2011. An emergency connection exists with the Town of Bamberg.

Currently, the Town of Denmark public water system has the following operators:

Operator	License	Certification #	Operator Grade
Cedric Hudson	Treatment	5044	A
	Distribution	785	A
Tim Freeman	Treatment	6651	D
	Distribution	1830	G

Findings and Recommendations

1. The system received a **Satisfactory** rating for **Water Quality**. The purpose of this item is to ensure that a water system consistently produces water which complies with established water quality standards. Recently the Department has not received many complaints of discolored water. In addition, sampling performed within the distribution system in 2015 showed that the drinking water is without total coliform bacteria and that it is meeting the secondary MCLs for iron and manganese. **Considering the history of poor drinking water quality in Denmark, this item will be closely evaluated during each subsequent Sanitary Survey.**

2. The system received a **Satisfactory** rating for **Fire Flow**. The purpose of this item is to ensure that the water system can provide adequate flow to protect the integrity of their water system when fire protection is provided. Hydrants must be flow tested at a minimum of once every three years with a minimum flow required for fire protection of 500 gpm. All fire hydrants were tested during the month of January 2013. The flow was greater than 500 gpm at all of the hydrants. Due to the recent heavy rains, fire flow has not been tested for 2016. Fire flow is scheduled to be tested within the next few weeks.

3. The system received a **Satisfactory** rating for **Flushing Program**. The purpose of this item is to ensure that the system's routine flushing program is adequate to help maintain a disinfectant residual throughout the system, as well as to help prevent water quality issues associated with stagnant, discolored, and sediment laden water over the long term. Two types of flushing programs are recommended for public water systems: 1) a system-wide flushing, where scouring velocities are maintained to clean the water lines, and 2) low velocity flushing used to maintain chlorine residuals in the distribution system. The system is doing a good job of routinely flushing their system and documenting flushing activities. The weekly flushing events seem to be improving water quality and preventing customer complaints. It is important to continue

communicating flushing events with the customers so that they will be prepared for potential discoloration.

4. The system received a **Satisfactory** rating for **Monitoring and Record Keeping.** The purpose of this item is to ensure the water system is monitoring their treatment process and maintaining records that verify that they are checking equipment operation and drinking water quality on a routine basis. Daily inspections are being performed as required.

5. The system received a **Satisfactory** rating for Sample Siting Plan. The plan has a map denoting all bacteriological monitoring locations. Records indicated that these locations were being sampled as scheduled in the plan. There are 15 representative locations that are sampled on a quarterly schedule. The system samples five of these locations on a monthly rotating schedule.

Conclusions

The Town of Denmark public water system is being operated in a safe and reliable manner. The Department would like to thank Mr. Cedric Hudson and Travis Clark for their assistance in conducting the sanitary survey. The Department looks forward to working with the system to ensure that the residents of Denmark continue to receive the highest quality drinking water.

D H E C

PROMOTE PROTECT PROSPER

Catherine B. Templeton, Director
Promoting and protecting the health of the public and the environment

Bureau of Water
April 11, 2013

City of Denmark
Attn: Dr. Gerald Wright, Mayor
4768 Carolina Highway
Denmark, SC 29042

Re: Consent Order Nos. 10-001-DW & 11-072-DW
City of Denmark
Public Water System No. 0510002
Bamberg County

Dear Mayor Wright:

The requirements of the above Consent Orders have been met and the Department considers Consent Order Nos. 10-001-DW & 11-072-DW closed. The official closure date is April 11, 2013.

If you have any questions concerning this notice, please contact me at (803) 898-4430.

Sincerely,

Daniel S. Malonza
Drinking Water Enforcement Section

cc:

Travis Fuss, Midlands BEHS, Aiken
Cedric Hudson, City of Denmark

REDACTED

Morris, Janine

From: Campbell-Dunbar, Shawneille
Sent: Wednesday, March 30, 2016 1:33 PM
To: Morris, Janine
Subject: FW: Denmark, SC-- --FW: Federal Dollar Misused
Attachments: DENMARK-SC0510002 Lead Results.xls; Re: SC Resident Complaint

Janine, Exemption 6 Personal Privacy

Here is where DWS left off with this issue.

From: Campbell-Dunbar, Shawneille
Sent: Friday, March 18, 2016 10:41 AM
To: Allenbach, Becky <Allenbach.Becky@epa.gov>
Cc: Morris, Janine <morris.janine@epa.gov>; Smith, Brian <Smith.Brian@epa.gov>; Gagliano, Paul <Gagliano.Paul@epa.gov>
Subject: Denmark, SC-- -FW: Federal Dollar Misused

Exemption 6 Personal Privacy

Becky,

The Region and SCDHEC have a long history of responding to Most recently, we were forwarded a letter from in January (scroll to the bottom). We reached out to the State because we knew they had been engaged previously. I had a conversation with Doug at that time and he explained that the State had recent sampling results (no violations) and had reviewed all of their data and information to see if there was anything missed. mentioned 78 violations below, but the State indicated this was not the case. Note Doug's message from today where he talks about how the State attempted to sample s drinking water but was refused entry.

I can't see where the Region has sent a formal letter to but Janine has extensive documentation of conversations she's had with him. I asked Doug if the State has written responses to but he indicated that all communication has been by phone or email. Exemption 6 Personal Privacy

Both agencies have been responsive. March 17th complaint focuses on the same issue raised in his January 4th complaint (as well as others received in the past). We don't have data that indicates a problem with the drinking water being supplied. Recent sampling results show no lead ALEs (see attachment). We can certainly call and try to explain the findings, but this will not put him at ease about the drinking water quality or his concerns for his mother. This leaves me wondering what options we're left with for this situation.

From: Kinard, Doug [mailto:KINARDDB@dhec.sc.gov]
Sent: Friday, March 18, 2016 8:14 AM
To: Campbell-Dunbar, Shawneille <Campbell-Dunbar.Shawneille@epa.gov> Exemption 6 Personal Privacy
Subject: Re: Federal Dollar Misused

The last Lead and Copper sampling in Denmark was in 2015, and the 90th percentile sample was non-detect. We tried to collect a sample from home, but he insisted that we not enter the house to collect the sample and sample from the outside faucet instead. We tried to explain the concept of first draw from a faucet regularly used for drinking water to no avail, so we did not collect the sample.

Douglas B. Kinard, P.E.
Director
Drinking Water Protection Division
Bureau of Water
SC Department of Health and Environmental Control
803-898-3543

REDACTED

From: Campbell-Dunbar, Shawneille <Campbell.Dunbar.Shawneille@epa.gov>
Sent: Friday, March 18, 2016 7:52 AM
To: Kinard, Doug
Subject: RE: Federal Dollar Misused

Exemption 6 Personal Privacy

Good morning, Doug. The Region has received a follow-up complaint . I am aware that there is a long history of SCDHEC responding to concerns. We discussed the complaint in January and you shared sampling results for lead (see below). Are there additional sampling results for this water system that you can share with me and is the finding below still correct? Our External Affairs Office has been engaged and we need to provide an update to them.

Thank you

From: Kinard, Doug [mailto:KINARDDB@dhec.sc.gov]
Sent: Monday, January 25, 2016 9:14 AM
To: Campbell-Dunbar, Shawneille <Campbell.Dunbar.Shawneille@epa.gov>
Subject: Re: Federal Dollar Misused

Shawneille,

Attached is a spreadsheet with recent drinking water Lead results for the Town of Denmark. As I mentioned on the phone, the Town of Denmark is currently in compliance with all EPA drinking water standards. There are no ongoing violations for the town's public water system. Let me know if I can provide any additional information.

Doug

Douglas B. Kinard, P.E.
Director
Drinking Water Protection Division
Bureau of Water
SC Department of Health and Environmental Control
803-898-3543

From: Campbell-Dunbar, Shawneille <Campbell-Dunbar.Shawneille@epa.gov>
Sent: Monday, January 25, 2016 8:41 AM
To: Kinard, Doug
Subject: FW: Federal Dollar Misused

REDACTED

From: Allenbach, Becky
Sent: Thursday, January 21, 2016 9:33 PM
To: Campbell-Dunbar, Shawneille <Campbell-Dunbar.Shawneille@epa.gov>
Cc: Morris, Janine <Morris.Janine@epa.gov>
Subject: Fwd: Federal Dollar Misused

Shawneille, with Janine out, who is the best person to investigate?

Sent from my iPhone

Begin forwarded message:

From: "Giattina, James" <Giattina.Jim@epa.gov>
Date: January 21, 2016 at 8:03:21 PM EST
To: "Allenbach, Becky" <Allenbach.Becky@epa.gov>, "Diaz, Denisse" <Diaz.Denisse@epa.gov>
Subject: Fwd: Federal Dollar Misused

Do we know anything about either drinking water or wastewater systems here? Huge sensitivity over potential drinking water issues...

Sent from my iPhone

Begin forwarded message: Exemption 6 Personal Privacy

From:
Date: January 21, 2016 at 12:44:02 PM EST
To: "info@scag.gov" <info@scag.gov>, WLTX WLTX <News19@wltx.com>, "FOIARouting.enrd@usdoj.gov" <FOIARouting.enrd@usdoj.gov>, The White House <reply-ff2a17757262-15_HTML-20835301-6229366-14707@mail.whitehouse.gov>, "Toy, Ashley" <toy.ashley@epa.gov>, "Contactus@trmchealth.org" <Contactus@trmchealth.org>, "Countonwis@wistv.com" <Countonwis@wistv.com>
Subject: Fwd: Federal Dollar Misused

---------- Forwarded message ----------
From: Exemption 6 Personal Privacy
Date: Jan 4, 2016 12:36 AM
Subject: Federal Dollar Misused
To: <FOIARouting.enrd@usdoj.gov>
Cc:

Dear Attorney General
I am a certified lab technician state florida. Denmark. S.C dont have water treatment. Plan also no sewage. Treatment plant.it on. Top ground going down in ground water. I have the evidence I have the pictures what buses are on top of the water tower. I'll talk to the mayor of the city of Denmark. D_x water department directed Douglas. Also Columbia South Carolina attorney general who signed 78 violations against Denmark South Carolina and has not been finished yet since 2007. This is 2016. you cannot pour chlorine down in the wells

REDACTED

and saying that you treating water. Denmark South Carolina was hooked up to the waterline in Bamberg South Carolina Denmark and they have not pay the water bill so water can be treated. The waterline been shut off over 7 years . so how come the people in Denmark South Carolina open for water is not being treated. it's a huge violation environment issue in Denmark South Carolina. talk to no response. I talk to everyone in the state they're all in the bed together. you have young kids only kids that are dying and a lot of them are going on dialysis machines. my mother has lead in her blood.

U can call

Exemption 6 Personal Privacy

Also u can call . Call Bamberg South Carolina water department ask to speak to a supervisor that tell you the line that runs to Bamberg to Denmark has been shut off over 7 years for the water could be treated. McLeod sellers . cloudburn. They all no about bad watet It Serious. Dont. Believe what nobody say in Denmark South Carolina in the water department . send. In Feds yourself from the environmental service and you will see all those violations raw sewage all over the ground near kindergarten. I'm trying to get this on CNN news and get it nationwide because a huge violations. Somebody been lying to the federal government about taking care of Denmark South Carolina. Send a Feds Washington DC in there and you see all the violations in for Columbia South Carolina 78 violations Denmark South Carolina

Send Feds

Exemption 6 Personal Privacy

REDACTED

3-30-2016

Janine Marris you ask me for this
dope was mail to Attorney General
in Washington, D.C.

Exemption 6 Personal Privacy

Exemption 6 Personal Privacy

Home

Cell

Exemption 6 Personal Privacy

HH: Janine Morris REDACTED 2 Copys

LOW COUNTRY HEALTH CARE SYSTEM
333 REVOLUTIONARY TR, PO BOX 990
FAIRFAX, SC 29827-7109
Phone: (803) 632-2533
Fax: (803) 632-3285

Patient ID:
Patient Name:
Date of Birth:

Exemption 6 Personal Privacy

Date of Service: July 7, 2011

To Whom It may Concern:

Exemption 6 Personal Privacy

I have advised , that i would not recommend chelation therapy for his current systemic lead level
Sincerely,
STEVE MISZKIEWICZ MD

Ht. Janine Harris

10 copys

REDACTED

LOW COUNTRY HEALTH CARE SYSTEM
333 REVOLUTIONARY TR, PO BOX 990
FAIRFAX, SC 29827-7109
Phone: (803) 632-2533
Fax: (803) 632-3285

Patient ID:
Patient Name:
Date of Birth:

Exemption 6 Personal Privacy

Date of Service: July 7, 2011

To Whom It may Concern:
I have advised and that until lead levels in city of Denmark,SC water system reach levels below 0.015 they are not to be exposed either by ingesting nor skin exposure. Please keep me informed as to the progress of removal of dangerous lead levels in public water supply.

Sincerely,
STEVE MISZKIEWICZ MD

Att: Joanne Morris

C. Earl Hunter, Commissioner
Promoting and protecting the health of the public and the environment

cc Copy

March 4, 2010

REDACTED

Exemption 6 Personal Privacy

Dear

On October 15, 2009 a water sample was collected from your home. The sample was analyzed for copper, iron, manganese, lead and total/fecal coliform bacteria. The results indicated no detection for any of the contaminants previously mentioned.

On February 17, 2010 another water sample was collected from your home. The results are as follows:

Sample	pH	Chlorine (mg/L)	Iron (mg/L)	Manganese (mg/L)	Copper (mg/L)	Lead (mg/L)
Exemption 6 Personal Privacy	7.30	.43	0.032	0.012	<0.010	<0.0020

The recommended limit for copper set by the U.S. Environmental Protection Agency (EPA) is 1.3 mg/L. The recommended limit for lead is 0.015 mg/L. The recommended limit for iron is 0.3 mg/L. The recommended limit for manganese is 0.05 mg/L. Both pH and chlorine are within acceptable (normal) ranges.

If you have any questions or need additional information please contact me at (803) 641-7670.

Sincerely,

Jennifer Hughes
Region 5 Aiken EQC

REDACTED

LabCorp LabCorp Burlington
1447 York Court, Burlington, NC 27215-3361

Phone: 800-762-4344

SPECIMEN	TYPE	PRIMARY LAB	REPORT STATUS	
295-078-5306-0	S	BN	COMPLETE	Page #: 1

Exemption 6 Personal Privacy

ADDITIONAL INFORMATION SS#: ***-**

RC:2,HS:2,TP:V,PP:I,CT: FASTING: N
PHONE: DOB:

PATIENT NAME SEX AGE(YR/MOS.)
/

CLINICAL INFORMATION
CD-20128114737

PHYSICIAN ID.	NPI	PATIENT ID.
HUMPHREY K	1043268352	

PT. ADD.:

ACCOUNT: Denmark Medical Center SCPC
Manual Account FHC SCPC
1241 Soloman Blatt Blvd
Denmark SC 29042-0000
ACCOUNT NUMBER: 39500815

Exemption 6 Personal Privacy

DATE OF COLLECTION	TIME	DATE RECEIVED	DATE REPORTED	TIME	
10/21/2010	14:57	10/22/2010	10/26/2010	6 36	7451

TEST	RESULT		LIMITS	LAB
Lead, Blood (Adult)	5	ug/dL	0 - 19	01

The Centers for Disease Control and Prevention states blood lead levels less than 10 ug/dL in children have been associated with numerous adverse health effects. New York State Guidelines: Blood lead levels in the range 5-9 ug/dL have been associated with adverse health effects in children aged 6 years and younger.

Environmental Exposure:
WHO <20
Occupational Exposure:
OSHA Lead Std 40

Detection Limit = 1

LAB: 01 BN LabCorp Burlington DIRECTOR: William F Hancock MD
1447 York Court, Burlington, NC 27215-3361

Pat Name: SMITH,EUGENE Pat ID: 249764525 Spec #: 295-078-5306-0 Seq #: 7451

Results are Flagged in Accordance with Age Dependent Reference Ranges

Att: Janine Morris

2 copies

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

REDACTED

October 11, 2010

Exemption 6 Personal Privacy

Exemption 6 Personal Privacy

Resident at
this address

Dear

On August 16, 2010 a water sample was collected from your home. The results are as follows:

Exemption 6 Personal Privacy

Sample	Iron (mg/L)	Manganese (mg/L)	Copper (mg/L)	Lead (mg/L)
	0.27	0.059	0.024	0.032

The recommended limit for iron set by the U.S. Environmental Protection Agency (EPA) is 0.3 mg/L. The recommended limit for manganese is 0.05 mg/L. The recommended limit for copper is 1.3 mg/L. The recommended limit for lead is 0.015 mg/L.

Thank you for assisting in collecting a first draw sample. We will be bringing you the sample bottles and instructions.

If you have any questions or need additional information please contact me at (803) 641-7670.

Sincerely,

Jennifer Hughes
Region 5 Aiken EQC

Exemption 6 Personal Privacy

LabCorp
Laboratory Corporation of America

LabCorp Burlington
1447 York Court
Burlington, NC 27215-3361
Phone: 800-762-4344

Specimen Number	Patient ID	Control Number	Account Number	Account Phone Number	Route
159-078-5630-0		20128114851	39500815		01

Patient Last Name:

Patient First Name: Patient Middle Name:

Patient SSN: ***-**- Patient Phone: Total Volume:

Age (Y/M/D): Date of Birth: Sex: Fasting: NO

Account Address:
Denmark Medical Center SCPC
Manual Account FHC SCPC
1241 Soloman Blatt Blvd
Denmark SC 29042

Patient Address:
PO BOX 439
Denmark SC 29042

Additional Information: RC:2,HS:2,TP:V,PP:R,CT:

Date and Time Collected	Date Entered	Date and Time Reported	Physician Name	NPI	Physician ID
06/08/11 09:49	06/08/11		GAFFNEY , T	1053368041	

Tests Ordered: Specimen Status; Lead, Blood (Adult)

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
Specimen Status	Will follow				
Lead, Blood (Adult)	6		ug/dL	0 - 19	01

The Centers for Disease Control and Prevention states blood lead levels less than 10 ug/dL in children have been associated with numerous adverse health effects. New York State Guidelines: Blood lead levels in the range 5-9 ug/dL have been associated with adverse health effects in children aged 6 years and younger.

Environmental Exposure:
WHO <20
Occupational Exposure:
OSHA Lead Std 40

Detection Limit = 1

01 BN LabCorp Burlington Dir: William F Hancock, MD
1447 York Court, Burlington, NC 27215-3361
For inquiries, the physician may contact Branch: 800-762-4344 Lab: 800-762-4344

SMITH, EUGENE 159-078-5630-0 Seq # 0000

06/15/11 10:23 ET **DUPLICATE PRELIMINARY REPORT** Page 1 of 1

Att: Janine Morris

Att: Janine [illegible] 2 copies

LabCorp Laboratory Corporation of America — LabCorp Burlington, 1447 York Court, Burlington, NC 27215-3361

REDACTED

Phone: 800-762-4344

Exemption 6 Personal Privacy

SPECIMEN	TYPE	PRIMARY LAB	REPORT STATUS	Page #:
300-078-3597-0	S	BN	COMPLETE	1

ADDITIONAL INFORMATION SS#. ***-**.

RC:2,HS:2,TP:V,PP:LCT: FASTING: N
PHONE: DOB:

PATIENT NAME	SEX	AGE(YR./MOS.)
		/

PT. ADD.:

DATE OF COLLECTION	TIME	DATE RECEIVED	DATE REPORTED	TIME	
10/27/2010	11:36	10/27/2010	10/29/2010	6:36	7775

CLINICAL INFORMATION
CD-20145339631

PHYSICIAN ID.	NPI	PATIENT ID.
GLENN W	1396760625	

ACCOUNT: Rural Health Center
Dr William Glenn IV
498 North Street PO Box 528
Bamberg SC 29003-1329
ACCOUNT NUMBER: 39500905

TEST	RESULT		LIMITS	LAB
Manganese, Blood				
Manganese, Blood	10.3	ug/L	8.0 - 18.7	01
Lead, Blood (Adult)	None Detected	ug/dL	0 - 19	01

The Centers for Disease Control and Prevention states blood lead levels less than 10 ug/dL in children have been associated with numerous adverse health effects. New York State Guidelines: Blood lead levels in the range 5-9 ug/dL have been associated with adverse health effects in children aged 6 years and younger.

Environmental Exposure:
WHO <20
Occupational Exposure:
OSHA Lead Std 40

Detection Limit = 1

LAB: 01 BN LabCorp Burlington DIRECTOR: William F Hancock MD
1447 York Court, Burlington, NC 27215-3361

Exemption 6 Personal Privacy

Pat Name BROWN,PAULINE | Pat ID 5501 | Spec #. 300-078-3597-0 | Seq #. 7775

Results are Flagged in Accordance with Age Dependent Reference Ranges

Last Page of Report

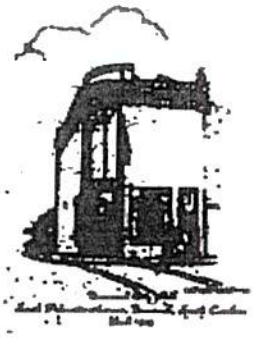
LCM Version: 03.25.00

Ms. Janine Morris 20 Copies

City of Denmark

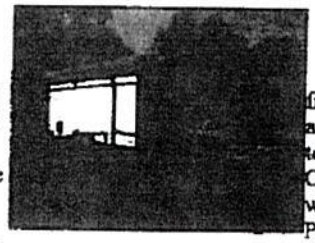
I Service Area and Customer Base

City of Denmark provides drinking water to customers within the city limits and most areas within close imity to the city limits including Voorhees College and Denmark Technical College. These two (2) colleges in mark are the only institutions of higher learning within Bamberg County. The water distribution system is ated and maintained by the City of Denmark Department of Waterworks. The City of Denmark also supplies r service eastward along U.S. Highway 78 to a wholesale service connection with the BBPW at the Bamberg nty Airport Industrial Park. The City of Denmark, also known as System No. 0510002 by the SCDHEC, serves oximately 1,500 water customers according to the SCDHEC's Sanitary Survey conducted in 2006.



! Water Supply and Treatment

City of Denmark owns four (4) groundwater wells. Only one (1) of these s, however, is currently in operation. The City of Denmark's groundwater s are known as the Brooker Center Well, Cox Avenue Well, Voorhees Road l, and Legare/Clark Street Well. Of those, the Cox Avenue Well was removed ity (20) years ago due to high levels of iron within the raw water which needs ibution to customers. On September 21, 2006, due to elevated levels of ker Center Well and trichloroethylene (TCE) in Legare/Clark Street Well, the ation of these wells as a precautionary measure. Water from these two (2) ated levels of two (2) organic chemicals regulated by the Environmental CDHEC. The PCE contamination in the Brooker Center Well has been linked to an old dry cleaner known as Colonial Cleaners by SCDHEC ials. The TCE contamination in the Legare/Clark Street Well is still under investigation by SCDHEC officials. Initial reports from SCDHEC ials indicate that the TCE contamination is not suspected to be linked to Colonial Cleaners. The City of Denmark activated an existing mutual greement between it and the BBPW. The BBPW has been supplying the City of Denmark with approximately 400,000 Gallons Per Day (GPD). important to note that the SCDHEC Bureau of Land and Waste Management is currently subsidizing a portion of the costs associated with the lesale purchase of the water from the BBPW with the State Dry Cleaners mitigation fund. The locations of the four (4) wells owned by the City enmark are illustrated in **Exhibit E**. Additionally, the production rates for the active well and the supply capacity purchased from the BBPW can ound in **Table 2.2.2-1**



le 2.2.2-1 City of Denmark-Groundwater Well Production

Well	Rated Pumping Capacity (GPM)	Well Volume (gallons)	
		Per 24 hours	Per 16 hours
ers Road	330	475,200	316,800
ale Water BBPW	Approximately 400,000 GPD		
Total volume per time period		875,200	716,800

being the case, based on the SPDWR, the City of Denmark ntly has a water supply capacity of approximately 0.859 MGD ding its wholesale supply connection to the BBPW after the City ntarily ceased operation of the Brooker Center Well and the re/Clark Street Well. Approximately fifty-seven percent (57%) e City of Denmark's total supply capacity is currently purchased igh a wholesale connection with the BBPW. If the City of nark's two (2) recently closed wells were not closed due to ated levels of PCE and/or TCE, then the supply capacity of the of Denmark's water system would be represented in **Table** -2.

e 2.2.2-2 City of Denmark
ndwater Well Production Rates Prior to September 2006

Well	Rated Pumping Capacity (GPM)	Well Volume (gallons)	
		Per 24 hours	Per 16 hours
Voorhees Road	330	475,200	316,800
Brooker Center	500	720,000	480,000
Legare/Clark Street	390	561,600	374,400
Total volume per time period		1,756,800	1,171,200
Total volume with largest well out of service		1,036,800	

The City of Denmark lost approximately sixty-nine percent (69%) of its capacity in September 2006 when voluntarily ceasing operation of the Brooker Center Well and the Legare/Clark Street Well as a precautionary measure. Additionally, the City of Denmark has approximately eighteen percent (18%) less total system capacity after ceasing the operation of the Brooker Center Well and the Legare/Clark Street Well, even with their agreement to purchase up to 400,000 GPD from the BBPW. Raw water from the active well is disinfected with gaseous chlorine. Given the current supply and demand within the system, the City of Denmark has an additional 152,600 GPD of surplus capacity that could be utilized. This information is tabulated in **Table 2.2.2-3**.

Table 2.2.2-3 City of Denmark-Current System Capacity

Item	Volume (GPD)
Total capacity	859,200
Current maximum water consumption	706,600
Surplus capacity available	152,600

Additionally, the largest five water customers of the City of Denmark, based on average monthly usage, are denoted in Table 2.2.2-4.

Att: Janine Morris 20 Copys

The City of Denmark has developed a water rate schedule based on usage and in-town or out-of-town customer status. Table 2.2.5-1, which denotes these rates, indicates that all customers are charged the standard monthly service fee for the first 2,000 gallons of usage. Customers that reside within the city limits are charged $7.50 per month and customers that reside outside the city limits are charged $12.50 per month. After the initial 2,000 gallons, in-town customers are charged a rate of $1.88 per 1,000 gallons for usage up to 10,000 gallons. After the initial 2,000 gallons, out-of-town customers are charged a rate of $3.13 per 1,000 gallons for usage up to 10,000 gallons. After 10,000 gallons customers residing within city limits are charged $2.50 per 1,000 gallons, and customers residing outside of the city limits are charged a rate of $3.75 per 1,000 gallons. As is the case with the residential customers of the BBPW, it is believed that an average residential customer of the City of Denmark uses approximately 5,500 gallons per month. Accordingly, an average monthly bill for a residence located within the city limits of Denmark would be $14.08, and a residence located outside city limits would be charged $23.46 per month. Commercial and industrial customers are subject to the same rates as residences located within or outside of the city limits.

Table 2.2.5-1 City of Denmark-Water Rate and Fee Schedule

Customer Status	Usage	Rate
Customers in City Limits	First 2,000 gallons	$7.50
	Each additional 1,000 gallons up to 10,000 gallons	$1.88
	Each additional 1,000 gallons above 10,000 gallons	$2.50
Customers outside City Limits	First 2,000 gallons	$12.50
	Each additional 1,000 gallons up to 10,000 gallons	$3.13
	Each additional 1,000 gallons above 10,000 gallons	$3.75

2.2.6 Financial Position

As required by law, an Audited Financial Statement is prepared on an annual basis for the City of Denmark to assess the Department of Water Works financial position. A summarized version of the 2006 Audited Financial Statement pertaining to the public water system can be found in **Table 2.2.6-1**, and a complete copy of the 2006 Audited Financial Statement - See - Appendix F.

Table 2.2.6-1 City of Denmark-Water/Wastewater Financial Statement

	Year
	2006
Operating Revenues	$649,359
Expenses	
Contract Services	$50,415
Insurance	Included in Contract Services
Operational Fees	$528,911
Depreciation	$98,009
Total Expenses	$677,335
Yearly Balance	($27,976)

From the summarized financial statement above, it appears that the City of Denmark Department of Waterworks needs to conduct a rate and fee study to asses the need for a potential water rate increase.

Water and Wastewater Feasibility Study Previous | Next | Top of Page

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    - City of Denmark
    - Town of Ehrhardt
    - Town of Govan
    - Town of Olar
  - Existing Wastewater Systems
    - Bamberg BPW
    - City of Denmark
    - Town of Ehrhardt
  - Projections
  - Water Improvements
  - Wastewater Improvements
  - Recommendations
  - Financial
  - Conclusions

itt:
JanineMorris
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2011 Annual Drinking Water Quality Report

City of Denmark — System #0510002

WHAT IS IN THE WATER?

Monitoring Period of January 1-December 31, 2011

Regulated Contaminants Detected

LEAD AND COPPER

Lead and Copper	Date Sampled	MCLG	Action Level (AL)	90% Percentile	# Sites Over AL	Units	Violation	Likely Source of Contamination
Copper	2011	1.3	1.3	0.075	0	ppm	N	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems.

REGULATED CONTAMINANTS

Disinfectants & Disinfection By-Products	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source of Contamination
Chlorine	2011	1	0-1	MRDLG=4	MRDL=4	ppm	N	Water additive used to control microbes.

Inorganic Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source of Contamination
Nitrate (Measured as Nitrogen)	2011	1	0-0.51	10	10	ppm	N	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.

Radioactive Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source of Contamination
Gross Alpha Excluding Radon and Uranium	2011	1.5	0-11.5	0	15	pCi/L	N	Erosion of natural deposits.
Uranium	2011	1.1	0-17.1	0	30	Ug/l	N	Erosion of natural deposits.

Synthetic Organic Contaminants including Pesticides and Herbicides	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source of Contamination
Di (2-ethylhexyl) Phthalate	2011	61	0-31	0	6	ppb	N	Discharge from rubber and chemical factories.

VIOLATIONS TABLE

Violation Type	Violation Begin	Violation End	Violation Explanation
Failure Submit Stage 2 DBPR Report	07/01/2010	2011	We failed to submit our initial distribution system evaluation (IDSE) report to our regulator. The IDSE report is needed to determine the best locations to use for sampling disinfection byproducts.
Failure To Have Monitoring Plan (IDSE)	04/01/2008	01/01/2011	We failed to develop, implement, and/or send to our regulator a monitoring plan for disinfectants and disinfection byproducts. As a result, we cannot be sure the sampling we did for the period indicated was satisfactory.

LEAD AND COPPER RULE

Violation Type	Violation Begin	Violation End	Violation Explanation
Follow-up or Routine Tap M/R (LCR)	07/01/2010	2011	We failed to test our drinking water for the contaminant and period indicated. Because of this failure, we cannot be sure of the quality of our drinking water during the period indicated.

Complete copies of the report can be obtained at the Denmark City Hall at 4768 Carolina Hwy., Denmark, SC

The Times and Democrat/thetandd.com The Big Stories Tuesday, June 12, 2012

Att: Janine Harris - 2C copys

9 RESULTSAny time AllPast 24 hoursPast weekPast month

1. Denmark, South Carolina - City-Data.com
   www.city-data.com/city/Denmark-South-Carolina.html
   Other colleges/universities with over 2000 students near **Denmark: South Carolina** ... Drinking **water** stations with addresses in **Denmark** and ... Contaminant: **Lead**
2. Denmark, South Carolina - Wikipedia, the free encyclopedia
   https://en.wikipedia.org/wiki/Denmark,_South_Carolina
   Denmark, South Carolina, City: Location of **Denmark**, ... • **Water**: 0.004 sq mi (0.01 km 2) Elevation: 240 ft (73 m) Population • Total: 3,538 • Density:
   Geography | History | Education
   Demographics | Transport | Notable people
3. Public Works Department - Bamberg County, South Carolina
   www.bambergcountysc.gov/index.php?option=com_content&task=view&id=
   Public Works Department P.O. Box 149 Bamberg, SC 29003 PHONE: ... 58 percent less **water** is used ... **Denmark**, SC 29042 CONTACT: Teresha Johnson PHONE: ...
4. Childhood Lead Poisoning Data and Information - SCDHEC
   www.scdhec.gov/.../Lead/LeadData
   Lead Data in **South Carolina**. ... **Childhood Lead Poisoning Data and Information**. **Lead** ... and/or the repair/maintenance of **water** towers or bridges ...
5. Waterworks in Denmark, South Carolina with Reviews ...
   www.yellowpages.com/denmark-sc/waterworks
   Find 2 listings related to **Waterworks** in **Denmark** on ... in **Denmark, South Carolina**. ... piping systems that transport potable and waste **water** throughout residential ...
6. **Related searches for** lead in denmark south carolina water
   - Where is **Denmark South Carolina**
   - City of **Denmark South Carolina**
   - Hotels in **Denmark South Carolina**
   - Pictures of **Denmark South Carolina**
   - **Denmark South Carolina** Police
   - **Denmark** North **Carolina**
7. City of Denmark Existing Water Systems Information
   waterandwastewaterstudy.bambergcountysc.gov/page20-34.htm
   The **City of Denmark** also supplies **water** ... the corridor along **South** ... The **City of Denmark** has received tentative approval for a grant from the **South Carolina** ...
8. South Carolina | EWG
   www.ewg.org/research/state-level-executive-summaries/south-carolina
   ... 1,276,319 people in 334 communities in **South Carolina** drank **water**. ... 665,543 people in **South Carolina** drank **water** from suppliers with excess levels of lead, ...
9. Sanitation Jobs in Orangeburg, SC | LinkedIn
   www.linkedin.com › Jobs › Sanitation Jobs
   North, **South Carolina** . **Denmark, South Carolina** . 27 days ago December 16, ... Center Store **Lead**. BI-LO Orangeburg, ...
10. CDC - Lead - Tips - Sources of Lead - Water
    www.cdc.gov/nceh/lead/tips/water.htm
    South Carolina; **South** Dakota; Tennessee, Texas, Utah, Vermont; ... for homes with children or pregnant women and with **water** lead levels exceeding EPA's action level ...
11. We think these are the most relevant results for your search. We've omitted some lower-quality results. See all results

1. **Related searches**
   - Where is **Denmark South Carolina**
   - City of **Denmark South Carolina**
   - Hotels in **Denmark South Carolina**
   - Pictures of **Denmark South Carolina**
   - **Denmark South Carolina** Police
   - **Denmark** North **Carolina**
   - **Denmark South Carolina** Newspaper
   - **South Carolina Water**

Att; Janine T. Harris

20 Copys

THE STATE OF SOUTH CAROLINA
BEFORE THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

IN RE: CITY OF DENMARK
PUBLIC WATER SYSTEM NO. 0510002
BAMBERG COUNTY

CONSENT ORDER
11-072-DW

The City of Denmark (Respondent) owns and is responsible for the proper operation and maintenance of the public water system No. 0510002 (PWS) that serves the customers of the City of Denmark located in Bamberg County, South Carolina.

Inspections of the PWS by South Carolina Department of Health and Environmental Control (Department) staff revealed that the Respondent failed to properly operate and maintain the PWS.

Based on discussions with the Respondent's representatives on October 27, 2011, the parties have agreed to the issuance of this Order to include the following Findings of Fact and Conclusions of Law. This Consent Order will replace and supersede Consent Order 10-001-DW.

FINDINGS OF FACT

1. The City of Denmark (Respondent) owns and is responsible for the proper operation and maintenance of the public water system No. 0510002 (PWS) that serves the customers of the City of Denmark located in Bamberg County, South Carolina.

2. The PWS consists of four (4) wells (G05109 – Well 2 Vorhees, G05160 – Well 4 Cox Mill, G05162 – Well 5 Acacia Street and G05163 - Well 6 West Voorhees Road), three (3) elevated storage tanks (City Hall, Nibco and Voorhees), one thousand five hundred

HP Officejet 4500 G510a-f All-in-One series

Fax Log for

Jan-00-00 00:00AM

Last Transaction

Date	Time	Type	Station ID	Duration	Pages	Result
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Att: Janine Y. Harris

2nd Copy

one (1,501) taps, serves a population of approximately three thousand eight hundred (3,800) and is classified by the Department as a Community PWS.

3. On January 25, 2010, the Department issued Consent Order 10-001-DW to the Respondent that required the Respondent to correct all of the deficiencies listed in the November 9, 2009 sanitary survey report. The deficiencies that still have not been corrected are Water Quality; Valve/hydrant Maintenance; Flushing Program, and Leak Detection and Repair.

4. On September 9, 2011, Department staff conducted a sanitary survey of the PWS which resulted in an "unsatisfactory" rating due to the following deficiencies:

   A. Chemical Feed was rated "unsatisfactory" in that the chemical feed lines were not labeled and the current water treatment operators were unfamiliar with the function of the HaloSan iron bacteria removal system.

   B. Chemical Storage and Handling was rated "unsatisfactory" in that the gaseous chlorine alarm at Well 4 was not functioning because the electric supply to Well 4 had been disrupted.

   C. Water Quality was rated "needs improvement" in that there was periodic discoloration of water and there was no detailed flushing program. This deficiency was documented and the item rated "unsatisfactory" during the June 24, 2009 sanitary survey and "needs improvement" during the August 18, 2010 sanitary survey.

   D. Cross Connection Control was rated "unsatisfactory" in that several testable backflow prevention devices had not been tested within the past year or failed initial testing and had not been repaired.

   E. Valve/Hydrant Maintenance was rated "needs improvement" in that there was no proper documentation of valve/hydrant maintenance. This deficiency was

Att: Janine Morris

20 Copys

documented and the item rated "unsatisfactory" during the June 24, 2009 sanitary survey and "needs improvement" during the August 18, 2010 sanitary survey.

F. Flushing Program was rated "unsatisfactory" in that there was no detailed and comprehensive flushing program available for review. This deficiency was documented and the item rated "needs improvement" during the June 24, 2009 and August 18, 2010 sanitary surveys.

G. Leak Detection and Repair was rated "unsatisfactory" in that there was no water audit available for review and a preliminary calculation showed an approximate water loss of fifty-two (52) percent. This deficiency was documented and the item rated "unsatisfactory" during the June 24, 2009 sanitary survey and "needs improvement" during the August 18, 2010 sanitary survey.

H. Storage Maintenance was rated "needs improvement" in that the Town Hall elevated storage tank was out service and had not been disconnected from the distribution system, the concrete pad at the base of the Voorhees elevated storage tank was deteriorated, and the most recent tank inspection reports had not been submitted to the Department.

I. Operation and Control was rated "unsatisfactory" in that there was a high water loss, inadequate record keeping, the treatment system at Well 4 was not being properly monitored, gaseous chlorine was not being stored in a safe manner and there was lack of a proactive approach in system operation and maintenance.

J. Sample Siting Plan was rated "needs improvement" in that there was no detailed sample siting plan available for review.

K. Monitoring/Record Keeping was rated "unsatisfactory" in that there was not adequate documentation of flushing and valve/hydrant maintenance, and a water audit had not been completed.

Att: Janice Morris

2 Copys

L. Corrections from Previous Survey was rated "unsatisfactory" in that deficiencies from the previous sanitary surveys had not been corrected.

M. Procedures Manual was rated "unsatisfactory" in that there was no organized procedures manual identifying current procedures.

N. Staffing was rated "unsatisfactory" in that the PWS failed to continuously manage the system proactively, adhere to established maintenance schedules and provide appropriate and organized documentation of system operations.

At least one (1) of the above noted deficiencies constitutes a significant deficiency under the Ground Water Rule.

5. On October 27, 2011, Department staff held an enforcement conference with the Respondent's representatives, Heyward Robinson (City Administrator, City of Denmark), Timothy Freeman (Water Treatment & Distribution Operator, City of Denmark) and Jimmie Shepherd (Maintenance, City of Denmark) to discuss the violations. The possibility of a Consent Order was discussed.

CONCLUSIONS OF LAW

Based upon the above Findings of Fact, the Department, pursuant to the State Safe Drinking Water Act, S.C. Code Ann. §§ 44-55-10 to 44-55-120 (2002 & Supp. 2010), reaches the following Conclusions of Law:

1. The Respondent violated the State Primary Drinking Water Regulations, 24A S.C. Code Ann. Regs. 61-58.7 (Supp. 2010), in that it failed to properly operate and maintain the PWS.

2. The State Safe Drinking Water Act, S.C. Code Ann. § 44-55-90(B) (2002), provides for a civil penalty not to exceed five thousand dollars ($5,000.00) a day per violation for any person violating the Act.

Att: Sannie T Harris

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NOW, THEREFORE, IT IS ORDERED, CONSENTED TO AND AGREED, pursuant to the State Safe Drinking Water Act, S.C. Code Ann. §§ 44-55-10 to 44-55-120 (2002 & Supp. 2010), that the Respondent shall:

1. Within forty-five (45) days of the execution date of this Order, pay to the Department a civil penalty in the amount of three thousand dollars ($3,000.00).
2. Within ninety (90) days of the execution date of this Order, correct the deficiencies listed in item three (3) A - N of the Findings of Fact on pages two (2), three (3), and four (4), and contact the Department's Region 5 Aiken Environmental Quality Control office at (803) 641-7670 to schedule an inspection to verify the completed work.

IT IS FURTHER ORDERED, CONSENTED TO AND AGREED that this Consent Order incorporates by reference all of the findings of fact and the conclusions of law contained in Consent Order 10-001-DW. Further, the requirements of this Consent Order supersede and replace the requirements in Consent Order 10-001-DW.

THE PARTIES FURTHER STIPULATE that the Respondent shall pay an additional civil penalty of nine thousand dollars ($9,000.00) should it fail to comply with any requirement pursuant to this Consent Order, including any implementation schedule approved by the Department. Such penalties shall be due and payable upon written notice to the Respondent. The Department's determination that a requirement has been missed shall be final. All penalties due under this paragraph shall be made payable to the South Carolina Department of Health and Environmental Control within thirty (30) days of notification by the Department. The stipulated penalties set forth above shall be in addition to any other remedies or sanctions which may be available to the Department by reason of the Respondent's failure to comply with the requirements of this Order. The Department's determination that the requirements have not been met shall be final.

Att: Janine Morris 20 copys

PURSUANT TO THIS ORDER, communications regarding this Order and its requirements are to include the Order number and shall be addressed as follows:

Daniel S. Malonza
S.C. Department of Health and Environmental Control
Bureau of Water- Drinking Water Protection Division
Drinking Water Enforcement Section
2600 Bull Street
Columbia, S.C. 29201

THE PARTIES UNDERSTAND that this Consent Order governs only the liability to the Department for civil sanctions arising from the matters set forth herein and constitutes the entire agreement between the Department and the City of Denmark with respect to the resolution and settlement of these matters. The parties are not relying upon any representations, promises, understandings, or agreements except as expressly set forth within this Order.

IT IS FURTHER ORDERED AND AGREED that failure to comply with any provisions of this Order shall be grounds for further enforcement action pursuant to the State Safe Drinking Water Act, S.C. Code Ann. § 44-55-80(A) (2002), to include the assessment of additional civil penalties.

[Signature Page Follows]

Att: Janine T Harris

20 Copys

FOR THE SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Date: 12/6/11

Robert W. King, Jr., P.E.
Deputy Commissioner
Environmental Quality Control

Date: 12-1-11

David E. Wilson, Jr., P.E., Chief
Bureau of Water

Date: 11/30/11

Douglas B. Kinard, P.E., Director
Drinking Water Protection Division
Bureau of Water

Reviewed by:

Date: 12/1/11

Attorney
Office of General Counsel

FOR THE CITY OF DENMARK

Date: Nov. 22, 2011

Signature

Gerald E Wright, Mayor

Print or type name and title

Att: Janine Harris

on copys

Call me
ASAP

DHEC

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

This Report Is Done Yearly, we are requesting all past years since this one is horrible.

September 23, 2011

Town of Denmark
Attn: Dr. Gerald Wright
4768 Carolina Highway
Denmark, SC 29042

RE: Sanitary Survey
System # 0510002

Dear Dr. Wright:

On September 20, 2011, a sanitary survey was conducted on the public water system serving the Town of Denmark. The intent of the sanitary survey is to evaluate the public water system's ability to provide a continuous supply of safe drinking water to its customers.

The Town of Denmark public water system received an overall rating of Unsatisfactory. Enclosed is a copy of the survey and a report, which includes a description of the public water system, specific findings made during the sanitary survey, and recommendations for correcting any deficiencies. This survey and the report should be kept on file for no less than ten (10) years and be made available to the public or DHEC upon request. It is requested that all parties responsible for the operation and maintenance of the water system review this report promptly.

If you have any questions or if I can be of any assistance, please call me at (803) 641-7670

Sincerely,

Brooke Davis
Environmental Health Manager
EQC Region 5- Aiken

cc: Marty Chaney, Bureau of Water

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
REGION 5 EQC

SANITARY SURVEY REPORT

Town of Denmark
Water System # 0510002
Bamberg County

Introduction

The South Carolina Department of Health and Environmental Control recently conducted a sanitary survey o the Town of Denmark Public Water System. This survey consisted of a review of the Department files and a on-site inspection by Department personnel on September 20, 2011. The following persons participated in th on-site inspection:

Brooke Davis	SCDHEC - Region 5 EQC, Aiken
Jimmie Shepherd	Town of Denmark
Heyward Robinson	Town of Denmark
Travis Clark	Town of Denmark

System Description

The Town of Denmark owns and operates a groundwater facility and associated potable water distribution system that serves approximately 3800 by approximately 1501 service connections. The Cox Mill Well has a iron bacteria treatment system, which consists of an injection of HaloSan tablets into the well twice daily whil the well is idle. Treatment contact lasts for 60 minutes, and treated water is then available for further disinfection as it is pumped into the distribution system. Information on the system's wells is given in the tab below.

Well Information

	Type	Horsepower	Yield (gpm)	Regulated Capacity (TGD)	Treatment
Well One Brooker Center	NOT IN SERVICE				
Well Two Voorhees	Turbine	60	330 gpm	316.80	Gaseous Chlorine
Well Three Legare Street	NOT IN SERVICE				
Well Four Cox Mill	Turbine	50	350	336.00	Gaseous Chlorine Iron Bacteria Removal (HaloSan)
Well Five Aracia Street	Submersible	40	403	386.88	Gaseous Chlorine
Well Six W. Voorhees	Submersible	40	325	312.00	Gaseous Chlorine

Three (3) elevated storage tanks with a total volume of approximately 475,000 gallons serve the Town of Denmark public water system. However, the City Hall Tank was taken offline in late 2008/ early 2009; at this time, the town does not foresee placing the tank back into operation.

To: Janine Harris 20 Copies

An emergency connection exists with the Town of Bamberg.

Storage Capacity

Tank	Capacity (gallons)
City Hall Elevated Tank (offline)	[illegible]
Nibco Elevated Tank	[illegible]
Voorhees Elevated Tank	[illegible]

Currently, the Town of Denmark public water system has the following operators:

Operator	License	Certification #	Class
Tim Freeman	Treatment	6551	D
	Distribution	1830	G
Jimmie Shepherd	Treatment	7449 (Lapsed	-
	Distribution	93[illegible] (lapsed)	G
Travis Clark	Treatment	[illegible]	1

Distribution & Water Department

Findings and Recommendations

The system received an Unsatisfactory rating for Chemical Feed. The purpose of this item it to ensure that the water system's chemical feed system is properly installed, maintained, and housed to provide adequate treatment, to prevent the potential for contamination, and to provide operator and public safety. Chemical feed lines at all wells must be labeled to include contents and the direction of flow. Also, current operators are unfamiliar with the function of the HaloSan iron bacteria removal system, designed by Berry systems, at the Cox Mill Well. A daily flow meter reading is the only monitoring provided for the treatment system. The system is designed to perform a self-check and provide information on run time, frequency of injection, etc. This information is not documented. A HaloSan residual test kit is commercially available but is not utilized by the system.

In addition, Well #5 and Well #6 have been placed into operation since the last survey. These new wells were permitted to feed phosphate at the treatment plants. It was stated during the survey that the system stopped feeding phosphate earlier this year. Please note that it is a violation of the Operating Permit to cease or commence treatment not defined by the Permit. A review of the laboratory analyses shows that water quality is such that the addition of phosphate is not necessary. This treatment requirement will therefore be removed from the Operating Permit. However, the system must obtain written approval from the Department in the future prior to adding or removing any chemical treatment process

Please note this item is considered a Significant Deficiency Item pursuant to the Ground Water Rule.

The system received an Unsatisfactory rating for Chemical Storage and Handling. The purpose of this item is to ensure that a sufficient supply of chemicals are available on-site and that these chemicals are properly stored and handled. The Cox Mill Well has been out of service for

- A schedule for regular exercise and routine maintenance
- Documentation of valve type, date of last exercise, number of turns to close, and a record of routine maintenance for each valve
- Documentation that valves are being exercise in accordance with the plan and that necessary maintenance is being performed

The hydrant program should include:

- An updated system map indicating the location and identification of all hydrants
- A schedule for flow testing and performing routine maintenance
- Documentation of hydrant type, date of installation, and a record of maintenance work performed for each hydrant
- Documentation indicating that maintenance and exercise is being performed in accordance with the plan

7. The system received an Unsatisfactory rating for Flushing Plan. The purpose of this item is to ensure that the system's routine flushing program is adequate to help maintain a disinfectant residual throughout the system, as well as to help prevent water quality issues associated with stagnant, discolored, and sediment laden water. Two types of flushing programs are recommended for public water systems: 1) A system-wide flushing, where scouring velocities are maintained to clean the water lines, and 2) low velocity flushing used to maintain chlorine residuals in the distribution system.

Since 2009, the town has conducted system wide flushing once. As noted in the last survey report, a more detailed and comprehensive written program must be developed and implemented. This procedure is vital, as system wide and dead-end flushing must be conducted on a routine basis.

The Department strongly encourages the system to utilize AWWA or South Carolina Rural Water Association guidelines to create and implement a rigorous, unidirectional, system-wide flushing program. As noted above, detailed records of each event must be maintained and the volume of water used should be incorporated into the water audit. System-wide flushing may be combined with yearly hydrant maintenance. However, records should also include the date, time, location, velocities, total flushing time, time to clear, volume of water used, and chlorine residual. This item has been noted in numerous past surveys as well as in Consent Order 10-001-DW, yet the system has failed to adequately and consistently address this deficiency.

8. The system maintained an **Unsatisfactory** rating for Leak Detection and Repair. Water line leaks and breaks are repaired quickly and the actions are being recorded in a log. However, at the time of the survey, a water audit was still not available for review. The water audit should include water used for flushing, fire fighting, leak loss, etc. An example audit is enclosed.

The Department recommends all water systems strive for an unaccounted water loss of 10% or less, and a direct comparison of gallons produced to gallons sold yields an extremely high volume of unknown water loss of approximately 52%. In addition to this volume of loss being unacceptable, the fact that the loss is unexplainable poses a contamination risk. The system should review the data it has obtained for billing and meter readings, as errors were apparent upon review and city personnel were unable to explain significant fluctuations in billing records. As discussed during the survey, the Department encourages the system to make every effort to

several weeks due to an electrical problem. The gaseous chlorine alarm system cannot function with a disruption to the power supply. Unless electricity is restored immediately, chlorine cylinders should be relocated and appropriately stored, as chlorine gas poses a significant public health risk.

3. The system received a **Satisfactory** rating for Chemical Injection Points. The purpose of this item is to confirm that chemical injection points are properly located to feed the chemical in a safe manner and do not interfere with other chemical additions. The chlorine injection point at the Voorhees Well could not be located. During the survey, Jimmie Shepherd stated that it was likely underground. As discussed, should problems associated with the chemical feed system arise in the future, or if maintenance requires excavation, the injection point should be placed and maintained within a vault box.

4. The system received a **Needs Improvement** rating for Water Quality. Although the town still has periodic discoloration issues, the Department and the town have received less citizen complaints. A vigorous system wide flushing sequence was completed last year throughout the town. Since this initial flushing, however, little documentation of flushing has been recorded. Records are difficult to follow, and the system has failed to develop and implement a detailed plan of how flushing should be conducted.

Please note this item is considered a Significant Deficiency Item pursuant to the Ground Water Rule.

5. The system received an **Unsatisfactory** rating for Cross Connection Control. Many service connections requiring testable backflow prevention devices have not been tested within the past year or failed initial testing and have not been repaired. Facilities are currently responsible for maintaining their backflow prevention device. However, the system has failed to provide adequate follow-up to ensure that each device is appropriately maintained. The Department requests that all facilities be brought into compliance within 30 days of the date of this report. Documentation showing that all facilities have been successfully tested within the last year must be faxed to (803) 641-7675.

6. The system received a **Needs Improvement** rating for Valve/Hydrant Maintenance. The town has a total of 185 fire hydrants. Thirty hydrants have been replaced during 2010 and 2011 and the town has eight more that will be installed in the near future.

Though the written plan states that all hydrants and valves are exercised on a yearly basis, records were difficult to follow. Recent records show adequate hydrant maintenance has been completed but indicate that only valves used during a repair have been exercised. According to the written procedure, all hydrants and valves must be exercised by the end of the year. The system must develop a detailed and systematic approach to ensure all hydrants and valves are exercised. As discussed during the survey, the frequency of exercise should be determined by the system, based on the role the valve plays in system operation. Critical valves should be exercised at a greater frequency than less integral valves. The system must maintain a more organized account of maintenance and exercise in adherence to the written program.

At a minimum, the valve program should include:

- An updated system map indicating the location and identification of all valves

City Hall Get FREE water Not Metered

rectify this loss, including contacting Rural Water Association for possible assistance in uncovering the origin of this discrepancy. This deficiency has been noted in past surveys.

The Department recommends the system establish and implement a meter replacement policy. The policy should identify aging and nonfunctional meters, describe an ongoing systematic approach to replacing meters in the future, and the installation of meters at all locations where water use is currently estimated, such as sprinkler systems utilized by the town.

9. The system received a Needs Improvement rating for Storage Maintenance. The Town Hall tank is currently valved off from the system. It was stated during the survey that the city does not intend to refurbish this tank and place it back into operation. Therefore, the tank must be physically capped and disconnected from the distribution system to protect against contamination.

In addition, the concrete pad at the base of the Voorhees storage tank is deteriorating. Pursuant to correcting deficiencies noted in Consent Order 10-001-DW, all tanks were inspected within the past two years. During the survey, the reports from these inspections were requested. However, as of the date of this report, this documentation has not been received.

10. The system was downgraded to an **Unsatisfactory** rating for Operation and Control. The purpose of this item is to ensure that the water system is operated in a manner that provides safe, reliable water to the customers. In response to Consent Order 10-001-DW, the system devised and implemented several plans to correct noted deficiencies. A review of paperwork since this time showed the system initially followed the plans, but did not continue as the plan dictated. Though the system has improved many of the items noted in Consent Order 10-001-DW, this rating is a direct result of high water loss, failure to appropriately maintain records, failure to monitor the treatment system at the Cox Mill Well, failure to store gaseous chlorine in safe manner, and a continuing lack of a proactive approach to system operation and maintenance. This rating will be reevaluated as the system devises and implements procedures necessary for operational vitality.

11. The system received a **Needs Improvement** rating for Sample Siting Plan. As discussed during the survey, the system should reevaluate the bacteriological sampling locations. Sites should represent all areas of the system where bacteriological contamination may persist, such as areas of low usage, low pressure, or dead end locations. The plan should include a map of the distribution system and a detailed description of how the sampling will be conducted.

12. The system received an **Unsatisfactory** rating for Monitoring/Record Keeping. As noted above, the system has failed to maintain complete and adequate documentation of flushing, valve/hydrant exercise and maintenance, and implement a water audit. It was noted in the 2010 survey report that new record keeping methods were in developmental stages. These changes were not apparent during the current survey as partial records were located in several different logbooks. As stated in previous surveys, the system should employ a more consistent, complete, and organized method of record keeping.

As noted above, current operators are unfamiliar with the operation and maintenance of the HaloSan iron bacteria removal system at the Cox Mill Well. The system is designed to perform a self-check and provide information on run time, frequency of injection, etc. This information

Att: Janine Morris

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is not monitored or recorded by system personnel. Daily checks of this system should include meter readings, information provided from the system self-check, chemical residuals, and chemical addition.

At this time, the Department strongly encourages that the system contact Berry Systems to request an instructional review session for the proper operation and maintenance of this treatment system. It is requested that the system inform the Department of the date and time of this meeting to ensure Department attendance.

Please note this item is considered a Significant Deficiency Item pursuant to the Ground Water Rule.

13. The system received an **Unsatisfactory** rating for Corrections from Previous Survey. The purpose of this item is to make sure that water systems return to compliance after deficiencies have been documented on previous sanitary surveys. The deficiencies listed in this report are items sited in previous reports and include Flushing Program, Valve and Hydrant Maintenance, Leak Detection and Repair, and Water Quality.

    Please note this item is considered a Significant Deficiency Item pursuant to the Ground Water Rule.

14. The system received an **Unsatisfactory** rating for Procedures Manual. The purpose of this item is to ensure that a water system maintains written procedures for the operation and maintenance of its system. At the time of the survey, no organized compilation was available, and many procedures existed in duplicate or triplicate, making it difficult to distinguish past practices from current procedures. The system needs to organize its procedures manual such that it may function appropriately as a useful reference tool. This item has been noted in past surveys.

15. The system received a **Satisfactory** rating for Certified Operator. Please note, a licensed operator must make daily well visits and only an operator of the appropriate grade shall make any adjustments to chemical feed systems. At this time, Tim Freeman is the only licensed operator employed by the system, as licenses held by Jimmie Shepherd lapsed many years ago.

16. The system was downgraded to a **Needs Improvement** rating for Staffing. The purpose of this item is to ensure that all water systems employ adequate staff to properly operate and maintain the system. The downgraded rating is a direct result of failure to continuously manage system maintenance in a proactive manner, adhere to established maintenance schedules, and provide appropriate and organized documentation of maintenance.

Conclusions

Due to the significant nature of the items listed above, the system has been referred to the Department's Drinking Water Enforcement section. The Department is committed to working with the water system to ensure that the residents of Denmark receive safe and reliable drinking water.